User Manual
&
Spare parts catalogue
for the TP 250 PTO K wood chipper in the park series

Linddana A/S . Ølholm Bygade 70 . DK-7160 Tørring . T +45 75 80 52 00 . tp@linddana.com . www.linddana.com

1 Introduction

Congratulations on your new TP wood chipper.

Linddana produces TP wood chippers of the finest quality by using the most modern production technologies, i.a. laser cutting, CNC technology and robot technology in bright and open production facilities.

For safety reasons and in order to get maximum pleasure from the wood cutter, it is important to read these instructions before use.

The user manual explains about safety, use and maintenance so that the work with the wood chipper will be safe and profitable.

This manual has been translated from Danish.

Linddana A/S

Jørgen Due Jensen, Managing director

Your distributor is always available with spare parts, advice and guidance.

Distributor stamp

 ©Copyright 2008

2 EU declaration of conformity.

Manufacturer:

LINDDANA A/S, Ølholm Bygade 70, Ølholm, 7160 Tørring, Denmark
hereby declares that

Wood chipper:

is in concordance with the provisions of the Machine Directive (Directive 06/42/EC) and with the national legislation which translates this directive;

is in concordance with the following other EC Directives:
2000/14/EC

Furthermore it is stated that
EN 13525 (harmonised standard), has been used.

Title: Managing director
Name: Jørgen Due Jensen

Ølholm, 02 November 2015

©Copyright 2008

3 Table of content

1 Introduction 2
2 EU declaration of conformity 3
3 Table of content 4
4 Use 5
5 Mounting instructions 6
5.1 Before use 6
5.2 Mounting instruction 8
6 Safety instructions 9
6.1 Safety regulations 9
6.2 Pictograms used 11
6.3 Noise level 13
6.4 Environmental instructions 13
7 Operation of the machine 14
7.1 Table 1 Regulating the number of revolutions for the retract rollers 15
8 Maintenance 16
8.1 Maintenance schedule 16
8.2 Lubrication and oil 17
8.3 Maintenance of the retract rollers 17
8.4 Changing worn parts 19
8.5 Grinding of knives 25
9 Special instruction for TP 250 MOBILE TURNTABLE 26
10 Hydraulics diagram, TP 250 without revolution guard 29
11 Hydraulics diagram TP 250 with revolution guard 29
12 Instruction for TP PILOT K 30
12.1 Description of the TP PILOT K control panel. 31
12.2 Functions 35
12.3 Setting roller speed. 36
12.4 Alarms 37
12.5 Comments 37
12.6 Technical data 37
12.7 Electrical mounting 38
12.8 Appendix 1; User display 39
13 Troubleshooting for wood chipper TP 250 42
14 Guarantee obligation for wood chipper 43
15 Technical data wood chipper 45
16 Accessories 47
17 Spare parts catalogue 47

 ©Copyright 2008

4 Use

The TP 250 wood chipper is designed for **stationary** wood chipping in the form of braches etc.

The machine must **not** be used for materials containing stone, metal or other foreign bodies. These foreign bodies can in the best case dull the knives and in the worst case break the machine. Knives and anvil can break when stone or metal comes in between them.

The machine must **not** be used for wood chipping of wood containing nails, screws, arming etc.

When feeding branches you must stand next to the feeding hopper (see fig. 1).
The branches can be thrown around when the retract rollers get a hold of them.
Logs must be fed into the machine from the back (see fig. 2).

Figure 1 Feeding branches

Figure 2 Feeding logs

Remember to keep the **knives** and **anvil** sharp, it makes feeding easier and gives a better quality chips, and besides it lovers the use of fuel considerably.

The machine must be inspected daily, meaning the rotor housing must be opened and the rotor, knives, anvil etc. must be inspected. By doing this you prevent unexpected stops and prolong the life of the machine.

The tractor or trailer upon which the machine is mounted must always have the brakes activated during work.

The machine must **not:**

- Be used for other materials than wood
- Be used to push trees, stubs etc.

There must **not** be equipment like forest chains, axes, chain saws etc. in the feeding hopper.

©Copyright 2008

5 Mounting instructions

5.1 Before use

The machine is equipped with a lifting point which is to be used when lifting the machine with a crane or any other hoisting device (ground assistance) (see Fig. 3). The machine can also be lifted with a fork lift truck. This is done by using the holes made for this purpose on both sides of the foot (see fig. 4). Make sure that the forks of the truck are put all the way through otherwise the machine can tip over. The TP 250 MOBILE TURNTABLE is mainly transported on the trailer wheels, but it can also be lifted with a fork lift truck under the trailer bearers (see fig 5).

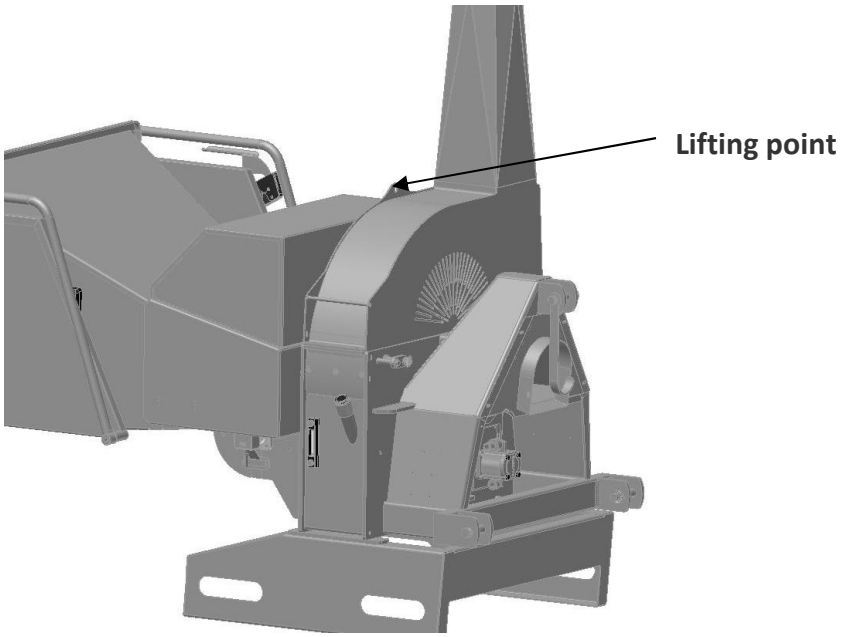


Figure 3 Lifting point on the machine

Figure 4 Lifting with a fork lift truck

 ©Copyright 2008

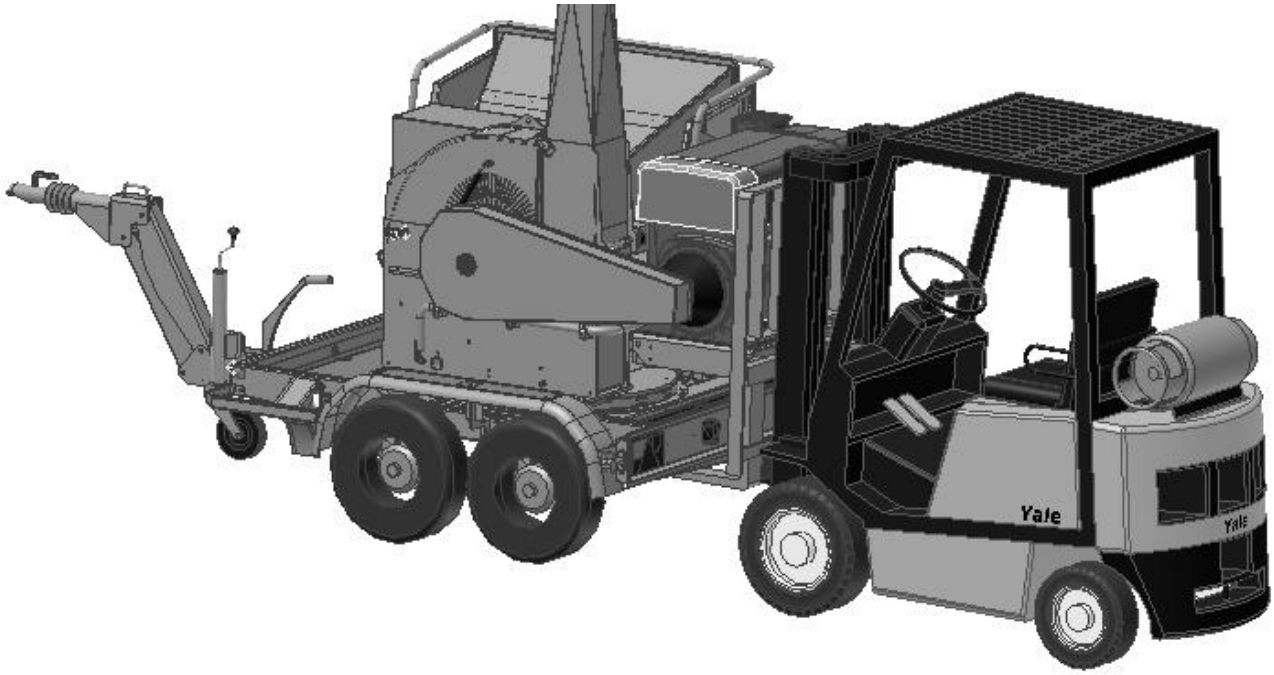


Figure 5 Lifting with a fork lift truck

Store the manuals for the PTO member with this manual in the manual box on the machine.

Before operation you must check that the wood chipper cleared of foreign bodies. The machine **must** be uncoupled from the tractor's PTO, and for the MOBILE models, the key **must** be removed from the ignition before opening for the rotor. Check that the rotor is at a complete standstill. Turn the ejector tube so that it faces the opposite direction of the rotor housing (see fig. 6). Loosen the
bolts that hold the upper and lower rotor housing together. Lift the top part of the rotor housing up until the ejector tube rests on its own. Turn the rotor a few times by hand. Remove any foreign bodies.

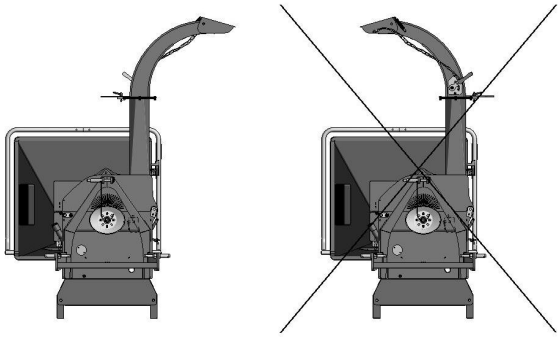


Figure 6

Position of ejector tube when opening rotor

Check that the gap between the knives and the anvil is correct = **0,7 mm**. The knives have a fixed **knife position** = **13mm.** Check that the knives are not rubbing on the anvils.

Lift the top part of the rotor housing back in place and tighten the bolts.
Check that all bolts, nuts and screws are tightened properly.
Remember to lubricate all the lubrication points (see maintenance schedule, page 16).
Old hydraulics and motor oil and used oil filters and air filters must be handed in at an approved receiving station.

 ©Copyright 2008

5.2 Mounting instruction

The machine is designed to be mounted on the tractor's three-point-suspension or trailer mounted with its own engine.

Machines for mounting on the tractor's three-point-suspension is delivered with a PTO axle with either 1 3/8" - 6 splines or 1 3/8" - 21 splines.
At 1000 rpm, certain types of tractors a PTO axle with 1 3/8" - 21 splines must be used.

The PTO axle **must** be mounted with free running on the machine side.
Linddana uses Walterscheid 2400 with free running which comes with the machine.

The length of the PTO axle has to be adapted to the tractor following instructions from the supplier of the PTO axle. See the attached manual for the PTO axle.

The machine must stand on a plane, horizontal surface during use and the tractor mounted machines must be attached to the tractor's three-point-suspension (see fig. 7). The tractor's brakes must be properly activated. Trailer mounted machines must also have their brakes activated (see fig. 8).

When starting the machine: Engagement must be done with the motor running at idle speed or at as few revolutions as possible in order to avoid overloading of the PTO axle, gear box, tractor and wood chipper.

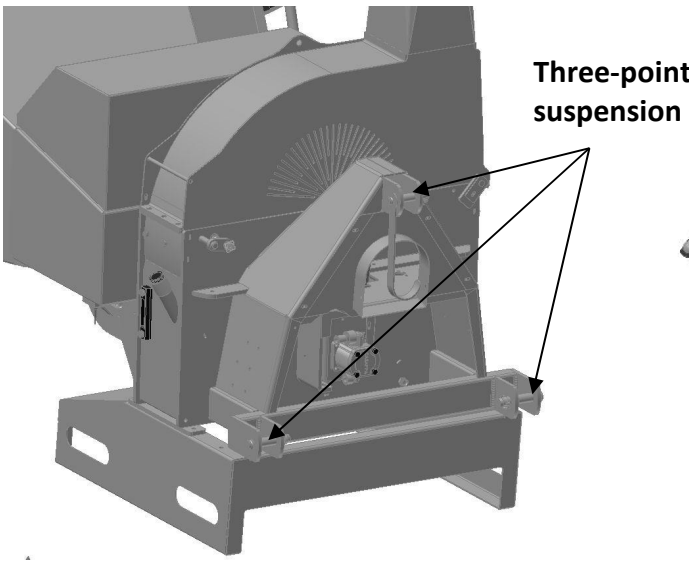


Figure 7 TP 250 PTO three-point-suspension

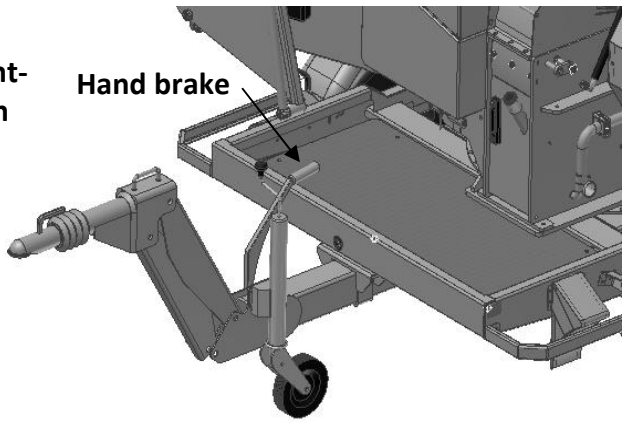


Figure 8 TP 200 MOBILE hand brake

 ©Copyright 2008

6 Safety instructions

6.1 Safety regulations

- Use hearing protectors, safety goggles or a similar eye protection, close fitting safety clothing and safety shoes.
- When working near roads it can be prudent to wear a west whish reflects the light to be more visible to the other road-users. The displaying of signs must be in accordance with the Road Traffic Act.
- Minimum age for users of the machine is 18, for training and under surveillance from an adult the age is 16.
- During operation, all body parts must be kept away from the feeding hopper and any moveable parts of the machine.
- Always stand next to the feeding hopper during feeding of the machine. Always observe the terrain conditions around the machine. It can be dangerous to fall near the machine!
- Before starting the machine check that the safety devices are working properly. Especially the stop and return functions on the operation bow.
- The machine **must** not be started without the ejector tube mounted to the machine.
- **Never** use the machine in closed or poorly ventilated spaces, because of the danger of carbon monoxide poisoning.
- The top part of the machine as well as all other shielding must **not** be opened/removed before the rotor disc is completely immovable and the tractor's motor is stopped.
- **Always** stop the machine and the tractor during inspections, service or repairs. The machine **must** be uncoupled from the tractor's PTO.
- Tractor mounted machines have to be on the ground before service or repairs are done.
- Always remove the keys from the machine and/or the tractor before leaving it.
- After maintenance and repairs, the machine must not be started before all bolts are tightened and all safety devices are mounted.
- Three-point mounted machines **must** be coupled to the tractor's three-point- suspension before use.
- The maximum rpm for the machine (1000 rpm) must **not** be superseded.
- The transmission axle's tube shielding and covering must always be intact. Safety chains on the transmission axle have to be properly mounted.
- The length of the PTO axle has to be adapted to the tractor according to the recommendations from the supplier of the PTO axle.
- The ejector tube must **not** point towards people or areas where there are people. There is a safety distance of 20 m. in the direction where the chips are thrown.

- **<u>AT DANGER:</u> PUT THE OPERATION BOW IN NEUTRAL (See fig. 10)**

 ©Copyright 2008

- During operation the machine's height may not supersede 600 mm over the terrain (see fig. 9). If this height is not maintained the operation/safety handle will not work as it should, and that may lead to risks of severe personal injury due to retraction.

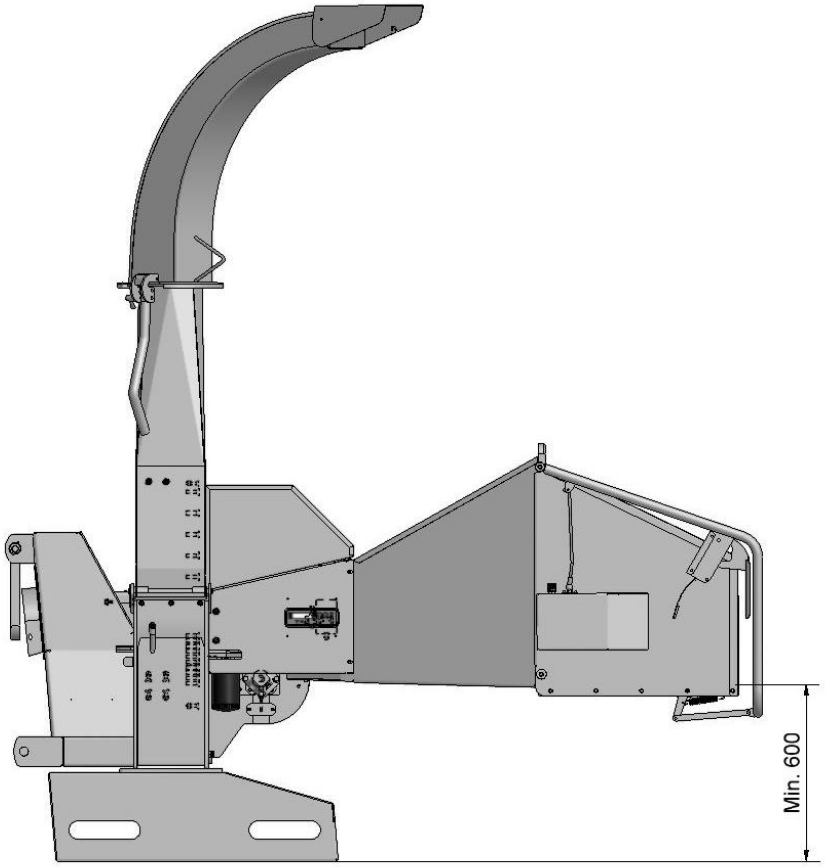


Figure 9 Maximum height over the terrain

- During transport or when the machine is dismantled, the PTO axle has to be placed in the machine's carrier bow.
- In case of transport on roads the ejector tube is turned so it is placed appropriately within the
  width of the machine and then it is fixed securely.
- During transport on public roads, the provisions of the authorities must be respected.
- During cleaning of the hopper, **THE RETRACT ROLLERS MUST BE STOPPED.**
- For cleaning a broom or similar **must** be used. Never touch the inside of the hopper when the machine is running.

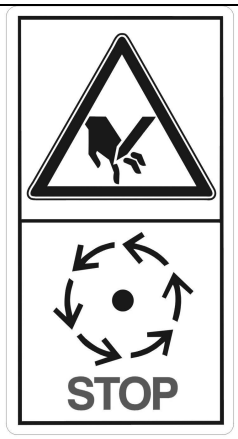
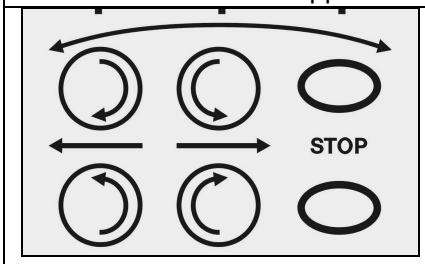
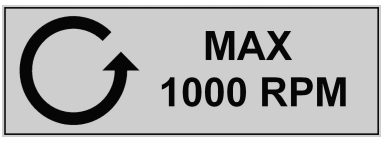
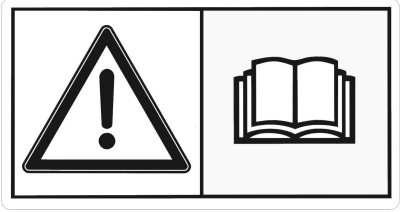
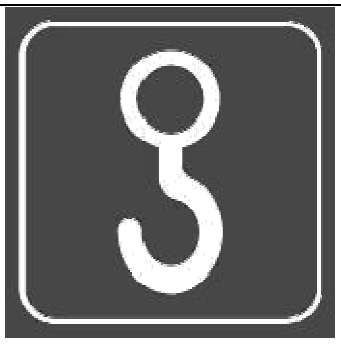
SPECIAL: TP 250 PTO K

- The machine must **not** be fed by hand since it has been designed for feeding by a crane.
- There is a security zone of 20 m around the tractor and the wood chipper. During operation no one except the driver of the tractor is allowed in this area.
- If people should come inside the security zone by accident, the emergency stop which stops all movement by the crane and feeding into the wood chipper must be pressed **immediately.** The emergency stop should **always** be activated when the driver leaves the driver's cab.
- **<u>AT DANGER:</u> AKTIVATE THE EMERGENCY STOP IN THE TRACTOR**

 ©Copyright 2008

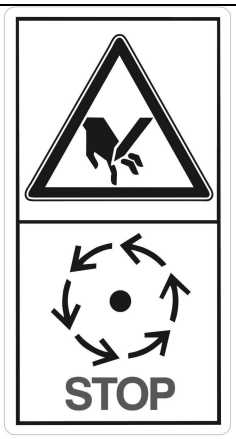
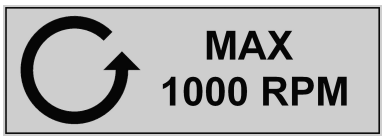
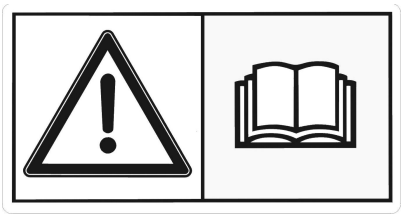
6.2 Pictograms used

TP 250 PTO

		
Warning: Objects thrown! Safety distance 20m!	Warning: Rotating knives! Wait for rotor to stop!	*Warning: Rotating rollers!*
Warning: Danger of retraction! Do not touch the hopper!	*Warning: Danger of retraction!* *Do not step on the hopper!*	
		
Functions of the operation bow	**Warning:** Max 1000 rpm, anti-clockwise direction of rotation!	*Read the manual before use!*
		
Lifting point for fork lift truck	*Hearing protector and eye protection prescribed!*	*Lifting point for crane!*

©Copyright 2008

TP 250 PTO K

		
Warning: Objects thrown! Safety distance 20m!	Warning: Rotating knives! Wait for rotor to stop!	*Warning: Must not be hand fed!*
		
Warning: Max 1000 rpm, anti-clockwise direction of rotation!	*Read the manual before use!*	
Lifting point for fork lift truck	*Lifting point for crane!*	

©Copyright 2008

6.3 Noise level

The sound effect level and the sound pressure level from the TP 250 PTO have been measured during use at 1000 rpm on the rotor disc, powered by a tractor.

The sound effect level and the sound pressure level from the TP 250 MOBILE have been measured during use at 930 rpm on the rotor disc, powered by the Hatz 4L41C motor engine.

The measurements have been conducted according to test provisions
Directive 2000/14/EC, 3. July 2000
EN ISO 3744, 1995
ISO 11201, 1995
ISO 4871, 19. March 1997
EN 13525, 17. February 2005

The guaranteed sound effect level which will be given by the manufacturer according to directive 2000/14/EC are as follows:

TP 250 PTO: 127 dB (A) re.1pW.
TP 250 MOBILE: 127 dB (A) re.1pW.

The machine's sound pressure level at the operator's seat is measured according to ISO 11201 at:

TP 250 PTO: 110 dB (A)
TP 250 MOBILE: 109 dB (A)

The above mentioned values have the common uncertainty for the method of measuring and the estimated variation in a product line for the type of machine. Detailed information on the measurements and results as well as estimation of uncertainty are found in a thorough report which can be given out on demand.
The sound level is of such a character that hearing protectors are prescribed during use of the machine.

6.4 Environmental instructions

When changing hydraulic oil or engine oil, oil and used oil filters and air filters must be handed in at an approved receiving station.

Oil spills must be avoided as much as possible. At oil spills, the spilled oil must be cleaned up and handed in at an approved receiving station.

Worn out parts must be disposed of for recycling.

When the machine is worn out it must be disposed of properly. Hydraulic oil and engine oil must be drained and handed in at an approved receiving station with oil filters and air filters.
The rest of the machine must be disposed of for recycling.

 ©Copyright 2008

7 Operation of the machine

The wood chipper is equipped with two hydraulic rollers, a pressure compensated flow valve, a control valve, an operation bow with a reset handle and a funnel handle (see fig. 10).
The funnal is hinged.
To make it easier to open and close the folding infeed funnel used the funnel handle that pulled out. Funnel handle is pushed back after opening and closing of the funnel.

The operation bow must be in the stop position (0) during start (see fig. 11). After start you release the reset handle and pull the operation bow into the middle position (A) and the rollers will turn. The material is now pulled into the machine.

By pulling the operation bow towards you (B), the flow of oil in the control valve is turned and the rollers reverse, the material is now pushed out of the machine.

When the machine is either stopped (0) or reversed (B), the reset handle will automatically block the operation bow. It is now necessary to release the reset handle before the operation bow can be moved into the middle position (A) and the rollers can pull the material into the machine. This reset handle is a safety measure so you cannot start the rollers by accident so they pull material into the machine.

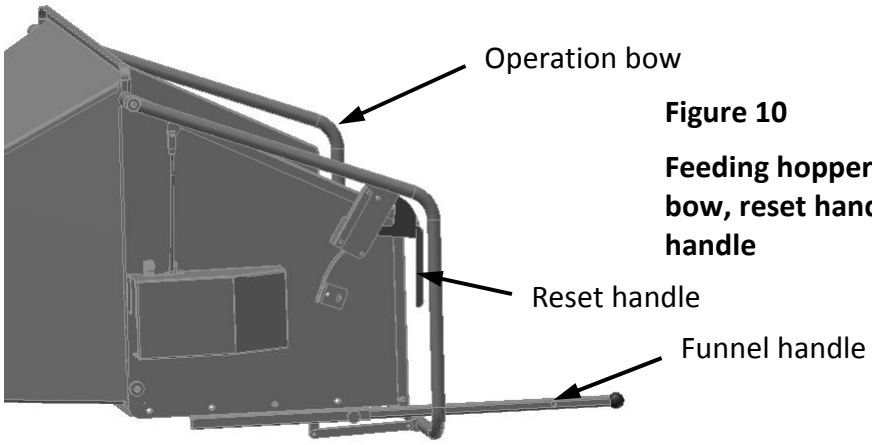


Figure 10

Feeding hopper TP 250 with operation bow, reset handle and extracted funnel handle

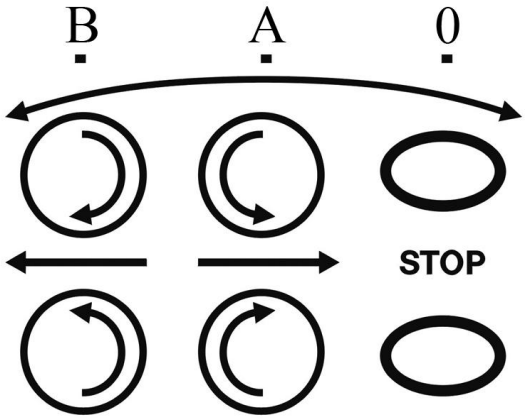


Figure 11

Direction to the operation bow

©Copyright 2008

By turning the adjusting screw on the flow valve you can find the correct rpm. Never go to fast with the rollers because the wood will work like a brake if the pressure on the rotor is too big with the ensuing increase in use of fuel. Branches can get wrapped around the rollers if the rpm is too high.

In the table below (table 1) are stated the recommended rpm on the retract rollers at a desired chip length. The speeds vary with the number of revolutions on the PTO axle. The chip length can be regulated on the flow-regulation valve on the wood chipper for smaller chip lengths than indicated in the table.

7.1 Table 1 Regulating the number of revolutions for the retract rollers

Chip length **Model**	**Rotor** **Rpm**	**4 mm**	**6 mm**	**8 mm**	**10 mm**	**13 mm**
TP250 PTO	1000	17	26	35	44	56
TP250 MOBILE TURNTABLE	900	16	24	31	39	51

 ©Copyright 2008

8 Maintenance

During all maintenance and repairs the machine and the drive must be shut off. Tractor mounted machines have to be placed on an even surface and be uncoupled from the tractor's PTO.

8.1 Maintenance schedule

Interval=> hours	**8 ⌛**	**50 ⌛**	**100 ⌛**	**200 ⌛**	**1000 ⌛**	**1.000 m³**	**10.000 m³**
Lubrication of the PTO axle[1]	X						
Check of knives and anvil	X						
Tightening of all nuts and bolts[2]	(X)	X					
Lubrication of main bearings for rotor disc[3]			X				
Tube connection for PTO axle cleaning/lubrication[4]				X			
Lubrication of roller bearings[5]				X			
Changing of return filter for hydraulic pump[6]		(X)			X		
Change hydraulic oil[7]					X		
Anvil turn/change[8]					X		
Change bow in top rotor housing[9]					X		
Turn/change triangle and square scrapers[10]						X	
Grind flats on retract rollers[11]						X	
Check V-belts[12]		X					
Check ejector wings for wear					X		
Check casing for wear and tear							X

[1] The PTO axle is dismantled and 4 lubrication nipples are lubricated with Uniway Li62 or something of similar quality.
[2] Bolts and nuts are tightened, the first time after 8 hours and then with an interval of 50 hours.
[3] Two lubrication nipples are lubricated with Uniway Li62 or something of similar quality.
[4] The PTO axle is dismantled and the tube connection is pulled apart, cleaned and lubricated.
[5] Two lubrication nipples are lubricated with Uniway Li62 or something of similar quality.
[6] Changed for the first time after 50 hours and then every 1000 hours.
[7] Drain the hydraulic oil and fill with new oil using 25 litres of **Hydraway HVXA 46** or oil that has the equivalent specifications. The interval between changing oil can be extended by using biodegradable hydraulic oil, such as the type **Hydraway SE 46 HP** and taking oil samples on an ongoing basis.
[8] The anvil is turned/changed depending on need.
[9] The bow in the top rotor housing is changed depending on need if it is mounted.
[10] The triangle scraper in the rotor housing is turned/changed. The square scraper on the rotor is turned/changed.
[11] The retract rollers are sharpened.
[12] The tightening of the V-belts is checked.

©Copyright 2008

8.2 Lubrication and oil

The Wood Chipper is as standard, factory-filled with hydraulic oil of the type **Hydraway HVXA 46**. When replacing the oil, use the same type of oil or oil with equivalent specifications. Do not mix together different types/brands of oils.

As an accessory, the Wood Chipper can be delivered factory-filled with biodegradable oil of the type saturated ester, **Hydraway SE 46HP**. When replacing the oil, use the same type of oil or oil with equivalent specifications. Do not mix together different types/brands of oils.

Old hydraulic oil and engine oil as well as used oil filters and air filters should be handed in to the local receiving station.

Lubrication nipples are lubricated according to the maintenance schedule with Statoil **Uniway Li62** or a similar product.

The machine is equipped with a hydraulic oil tank which is integrated in the rotor housing. The tank is equipped with a filler neck, an air release valve, a level glass and a return filter.

When changing the hydraulic oil, the filler neck is opened (see fig. 12).
The drain plug is unscrewed. The oil is drained into a canister for proper removal. When the tank is almost empty, the tank is sucked empty with an oil suction device. The drain plug is screwed back and new hydraulic oil is slowly filled in (25 litres for TP 250).
Oil is filled in until the level glass is half filled.

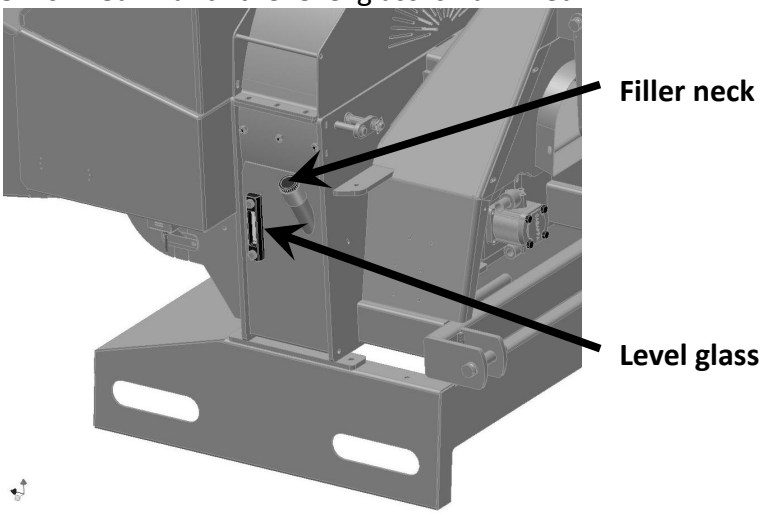


Figure 12 Filling hydraulic oil

8.3 Maintenance of the retract rollers

The retract rollers pull the material into the rotor disc and the knives.

The plates on the bottom retract roller must be kept sharp in order to keep the retract force.

 ©Copyright 2008

This is how it is done:

Stop the machine and the drive. Uncouple the tractor's PTO. Check that the rotor is at a **complete** standstill. Turn the ejector tube so it faces the opposite direction of the rotor housing (fig. 6). Loosen the bolts which hold the two parts of the rotor housing together and open the rotor housing. With multigrip pliers or something similar, the spring is lifted off the top retract roller. Grab the handle and open the roller housing and push the locking pawl into the lock in the side plate (fig. 13). The roller housing is now secured from falling down.
Now the flats on the bottom retract roller can be grounded with an angle grinder.

Turn the rotor carefully with the operation bow in position forward or reverse. By doing this, the retract roller is turned so all the plates can be ground.

Remember that the welding seams are not to be ground away.

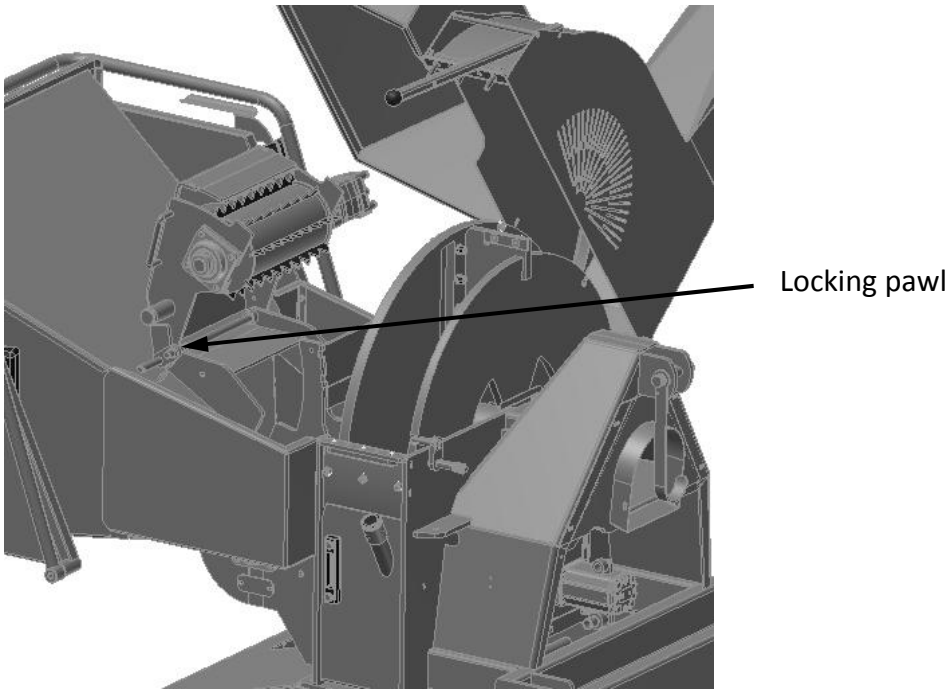


Figure 13 Securing with locking pawl

When the roller has been grounded, the top retract roller is lowered back in place. The spring is put back with multigrip pliers. Close the rotor housing and screw the bolts back.

 ©Copyright 2008

8.4 Changing worn parts

8.4.1 Anvil

The anvil in the machine is used as wearing bar for the knife in order to cut the wood. The anvil must be sharp-edged otherwise the wood will bend down and the cut will become frayed. The machine is equipped with one horizontal anvil with two edges and one vertical anvil. The vertical anvil can be turned.

This is how it is done:

Stop the machine and the drive. Uncouple the tractor's PTO. Check that the rotor is at a **complete** standstill. Turn the ejector tube so it faces the opposite direction of the rotor housing (fig. 6). Loosen the bolts which hold the two parts of the rotor housing together and open the rotor housing. With multigrip pliers the spring is lifted off the top retract roller and the roller housing is lifted and secured with the locking pawl (see fig. 13).

Dismantle the three bolts which hold the horizontal anvil. This is done from the outside and from below. The anvil is taken out and turned/replaced. Before the anvil is put back, the anvil and the bearing surface must be cleaned carefully. The distance between the knife's edge and the anvil must be **0.5-0.9 mm**. (See fig. 14). The tightening factor for the bolts for the horizontal anvil is **200 Nm / 20 KPm.** (Accessory: in the tool kit there is a torque wrench).

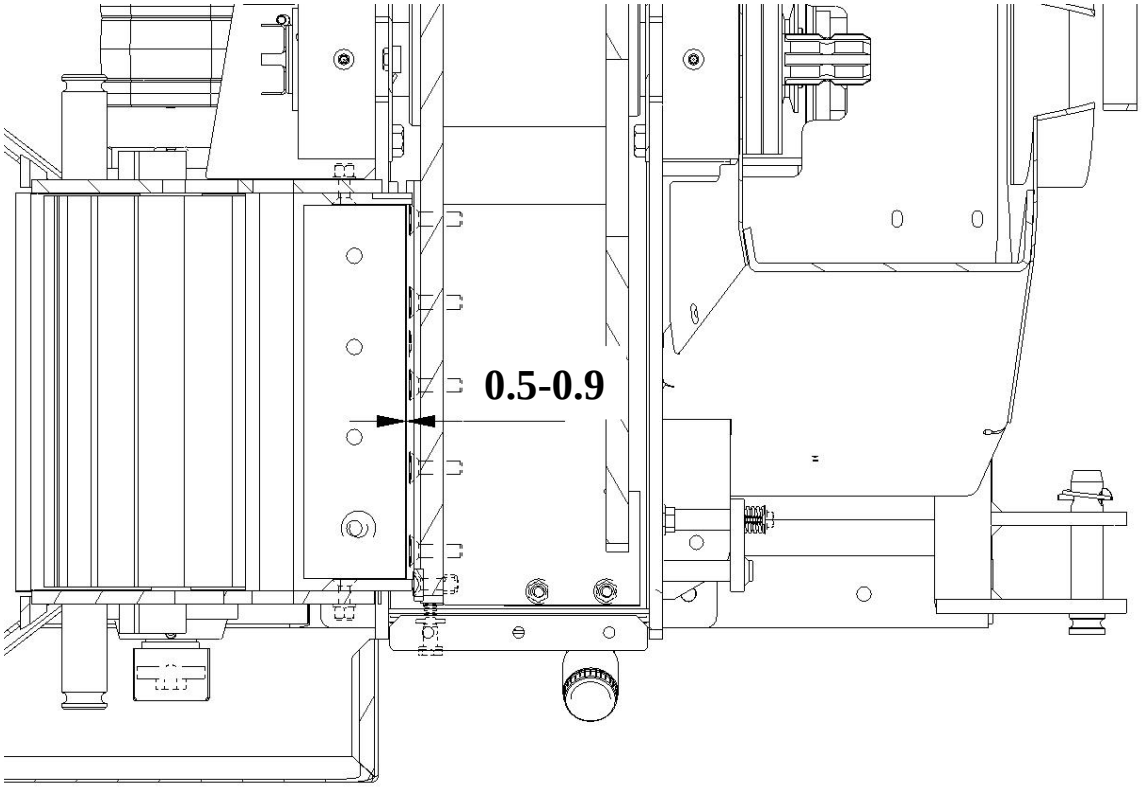


Figure 14 Distance between anvil and knife

 ©Copyright 2008

The vertical anvil is unscrewed and removed from the inside. Before a new one is put in, the anvil and the bearing surface must be cleaned carefully. The anvil is set to a distance of **0.5-0.9 mm** to the knives. Use a new precision feeler gauge. The bolts for the vertical anvil are tightened to **50 Nm /**
5 KPm.

When the anvils have been turned or replaced and all the bolts are tightened, the roller housing is lowered with the top retract roller in place. The spring is put back by using multigrip pliers (see fig. 13).

Turn the rotor a few times to make sure that there are not any objects in the rotor housing. Close the
rotor housing and tighten the bolts (see fig. 15).

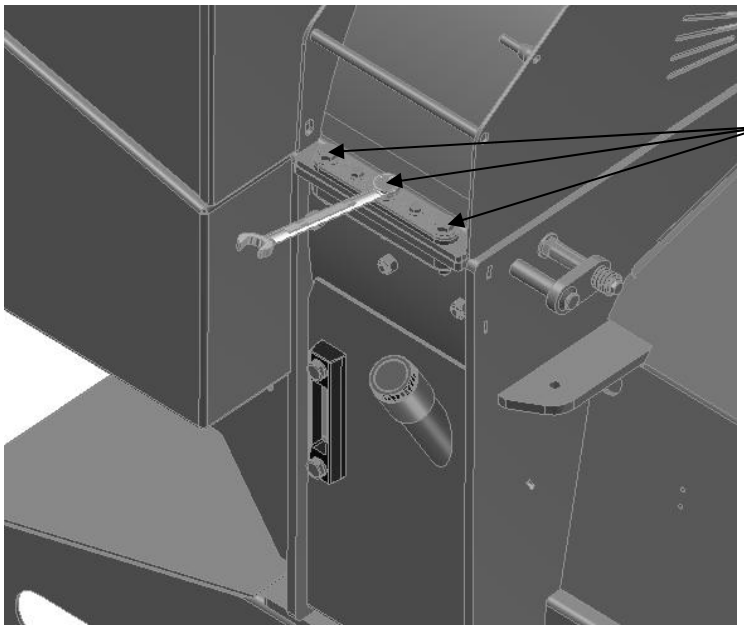


Figure 15 Tighten of bolts in the rotor housing

8.4.2 Knives

The machine is equipped with three knives.

The knives must always be changed in sets. The knives belong together in sets, also when they are ground so that they are always of equal width. If the knives are not of equal with the rotor will be out of balance which will lead to unnecessary strain on the bearings and vibrations in the whole machine.

 ©Copyright 2008

This is how it is done:

Stop the machine and the drive. Uncouple the tractor's PTO. Check that the rotor is at a **complete** standstill by looking at the two-coloured axle end. Turn the ejector tube so it faces away from the rotor housing (fig. 6) Loosen the bolts which hold the two parts of the rotor housing together and open the rotor housing.

The rotor is turned until the rotor lock can go into one of the holes on the rotor. Now the rotor is locked (see fig. 16). Be careful that your fingers are not near the knives when the rotor is turned.

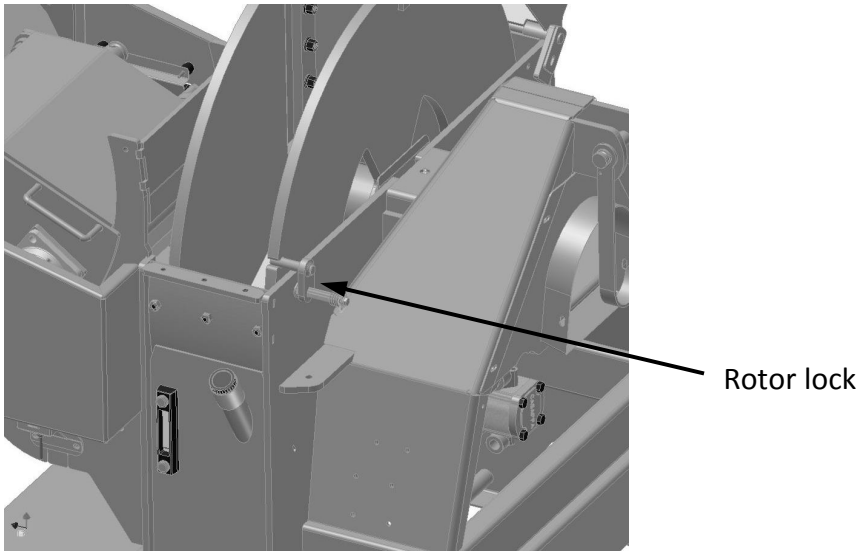


Figure 16 Locking the rotor with rotor lock

Remove the four nuts which hold the knife to the rotor. Take out the knife. The bearing surfaces on the chipping disc and the knife must be cleaned properly before fitting the knives. On fitting the nuts **must** be slightly greased (μ=0,125) meaning thin oil, WD 40 or something similar. Copper grease, MoS_2 or similar low friction grease must **not** be used.

Check that the distance between the knife's edge and the anvil is set correctly at **0,7 mm**.

The nuts must be tightened with **95 Nm / 9,5 KPm**. (Use a torque wrench for this which is included in the tool kit. This can be bought as an accessory).

When the knives are changed, the rotor is turned a few times to make sure that there are not any objects in the rotor housing. Close the rotor housing and tighten the bolts (see fig. 15).

 ©Copyright 2008

8.4.3 Scrapers and facing plate

The machine is equipped with three square scrapers on the rotor disc, a triangle scraper in the rotor housing and a facing plate in the ejector tube (see fig. 17).

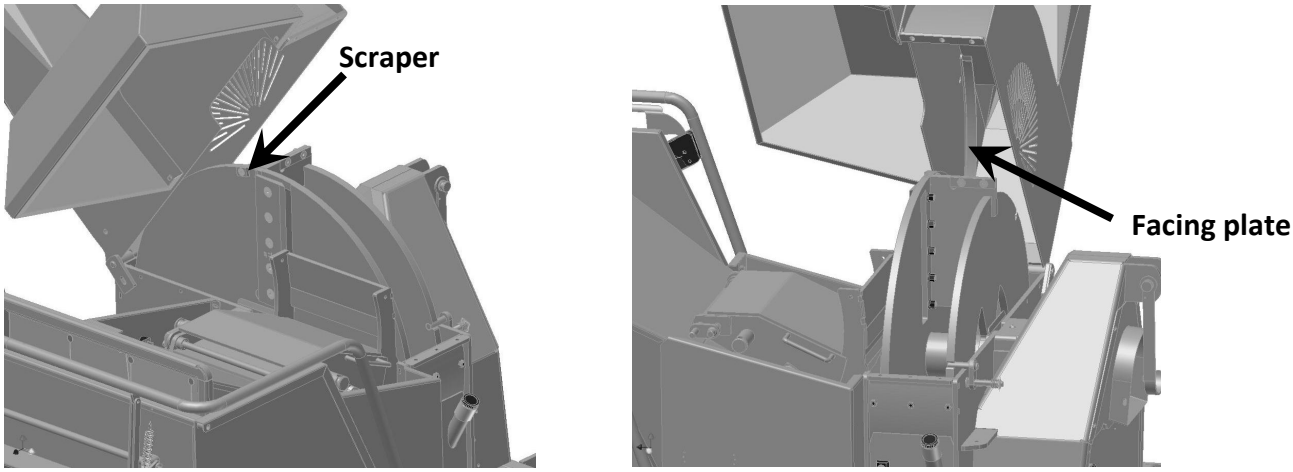


Figure 17 Placement of the scrapers and the facing plate

The purpose of the scrapers is to remove any material which might get stuck to the knives.
At the same time the square scraper on the rotor removes material which falls off in front on the chipping disc.
This reduces the wear to the casing and reduces the consumption of fuel.

The square scrapers can be turned once before being changed, while the triangle scraper and the facing plate should always be changed when they are worn.

This is how it is done:

The rotor is turned until the rotor lock can go into one of the holes on the rotor. Now the rotor is locked (see fig. 16). Be careful that your fingers are not near the knives when the rotor is turned.

Dismantle the countersunk bolts which hold the square scraper on the rotor. Turn the square so that a sharp edge points up. Clean the block and the bearing surface. Put the square scraper back. If it is worn on two edges, the square scraper has to be changed. Always change the square scraper on the rotor in sets. Change the triangle scraper when it is worn.

The facing plate is mounted in the top part of the rotor housing and can easily be changed by dismantling three bolts on the outside of the rotor housing. If chip quality is not important the facing plate in the ejector tube can be removed. This will increase the capacity of the machine and save fuel. The facing plate has to be dismantled when chipping wet conifer with a lot of needles. Then a good ejection is ensured.

When the scrapers have been turned or changed, the rotor is turned a few times to make sure that there are not any objects in the rotor housing. Close the rotor housing and tighten the bolts (see fig. 15).

©Copyright 2008

8.4.4 Casing

The TP 250 is equipped with an interchangeable casing at the bottom of the rotor housing. The casing absorbs the wear and tear which would normally happen at the bottom of the rotor housing.

This is how it is done:

Stop the machine and the drive. Uncouple the tractor's PTO. Check that the rotor is at a **complete** standstill. Turn the ejector tube so it is pointing away from the rotor housing (see fig. 6) Loosen the
bolts which hold the two parts of the rotor housing together and open the rotor housing. Remove the top part of the rotor housing.

Dismantle the six bolts and nuts which hold the casing to the bottom part of the rotor housing (see fig. 18).
Hit with a hammer on the part of the casing which sticks up over the edge of the rotor housing at the hinge side to loosen the casing. Now the casing can be swung out.

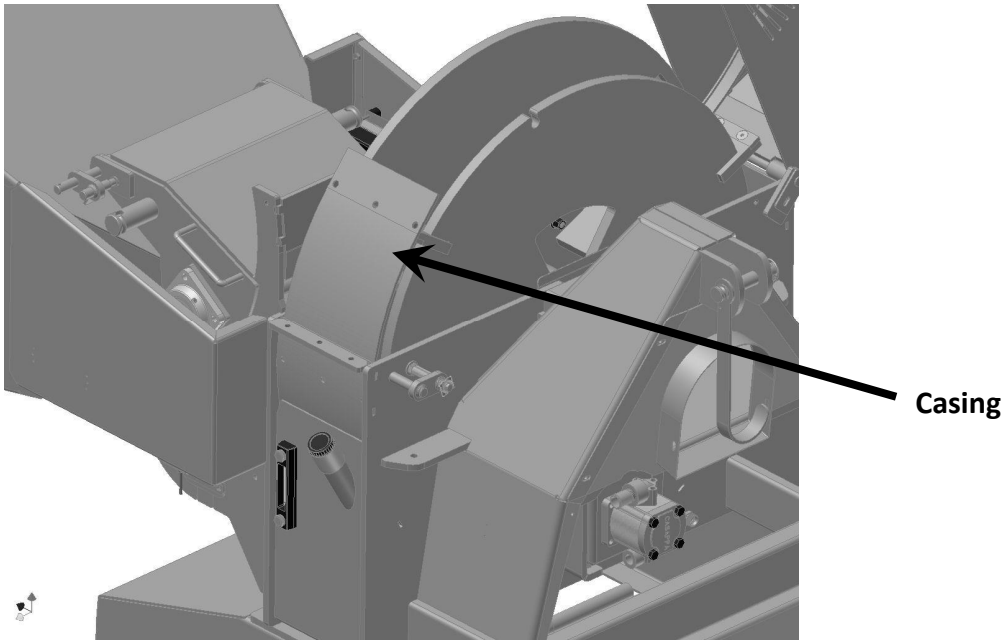


Figure 18 Changing the casing

Before a new casing is put in, you must clean the bottom of the wood chipper. Mount the new casing with six bolts. Put the top part of the rotor housing back.

When the casing has been changed the rotor is turned a few times to make sure that there are not any objects in the rotor housing. Close the rotor housing and tighten the bolts (see fig. 15).

 ©Copyright 2008

8.4.5 Adjusting the V-belts

Pump transmission

The retract rollers are run hydraulically. The hydraulic pump to the retract rollers is run by V-belts. The V-belts need to be check regularly or when the belts are suspected to be slack.

This is how it is done:

Stop the machine and the drive. Uncouple the tractor's PTO. Check that the rotor is at a **complete** standstill. Turn the ejector tube so it faces away from the rotor housing (fig. 6) Loosen the bolts which hold the two parts of the rotor housing together and open the rotor housing.

Loosen the four screws which hold the hydraulic pump in place and adjust the tension by turning the adjusting screw. Used belts are allowed to bend 5.87 mm when they are pushed down with 50-54 N (5-5,4 kg), for new belts this number is 57-61 N (5,7-6,1 kg) (See fig. 19). The belts can be measured with a gauge for this purpose which can be bought as an accessory.

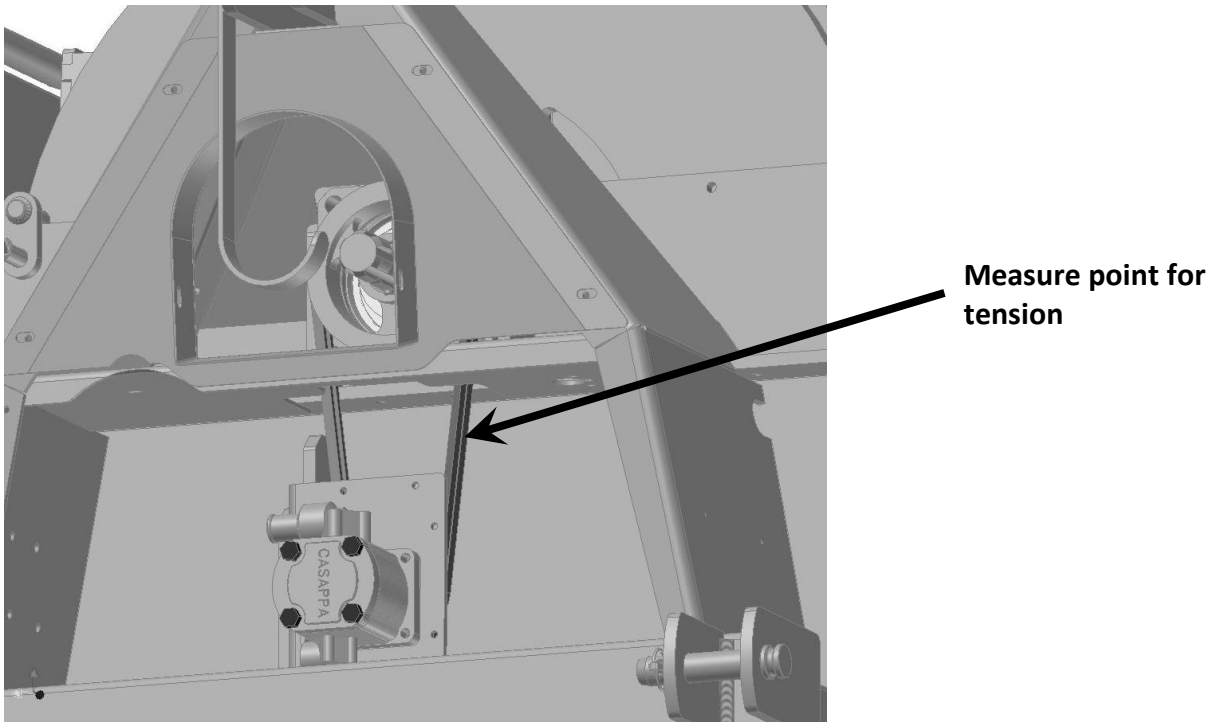


Figure 19 Adjusting the tension

When the V-belts have been tightened, the rotor is turned a few times to make sure that there are no objects in the rotor housing. Now the rotor housing has to be closed and the bolts have to be tightened (see fig. 15).

 ©Copyright 2008

8.5 Grinding of knives

It is very important for the quality of chips that the knives are sharp. They have to be checked at least once a day. The grinding interval of the knives can be prolonged by grinding them with a carborundum stone regularly.

The grinding can be done as wet grinding with a bond stone (see fig. 20). **Never** use an angle grinder or a similar tool for grinding the knives.

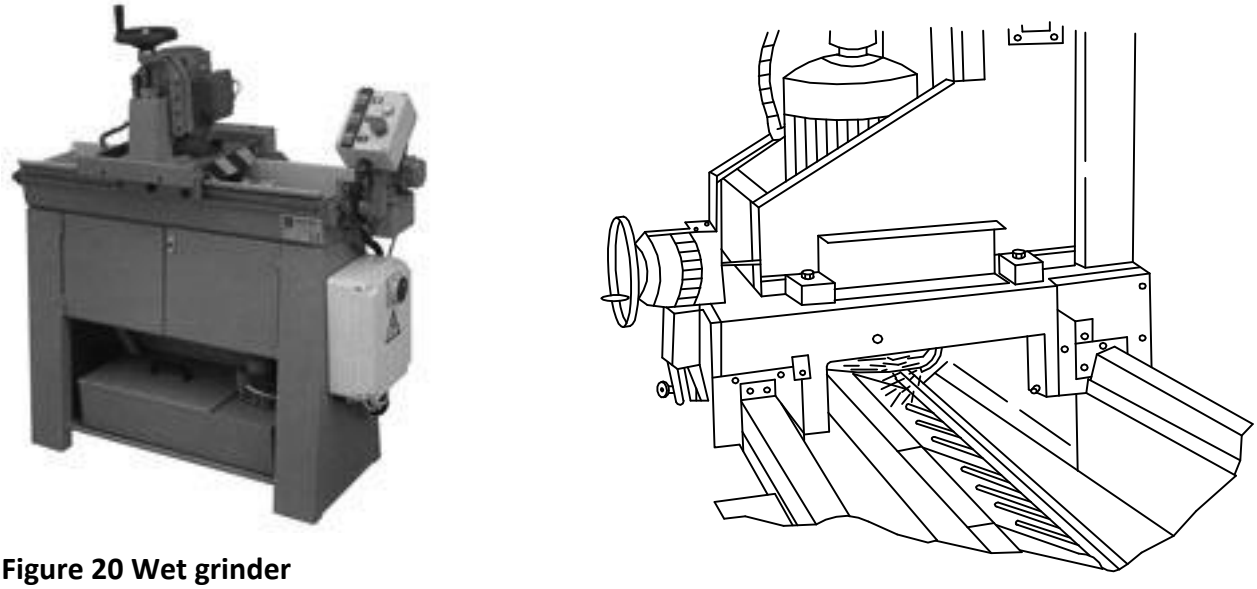


Figure 20 Wet grinder

When grinding knives you have to pay attention to the width of the knife set. The width has to be the same because of the balancing of the rotor. Therefore, the knives always have to be ground in sets. The knives must have a measurement of min. 90 mm (See fig. 21). After that they must be thrown away.
The edge of the knives must be ground at an angle of 28°. (See fig. 21).

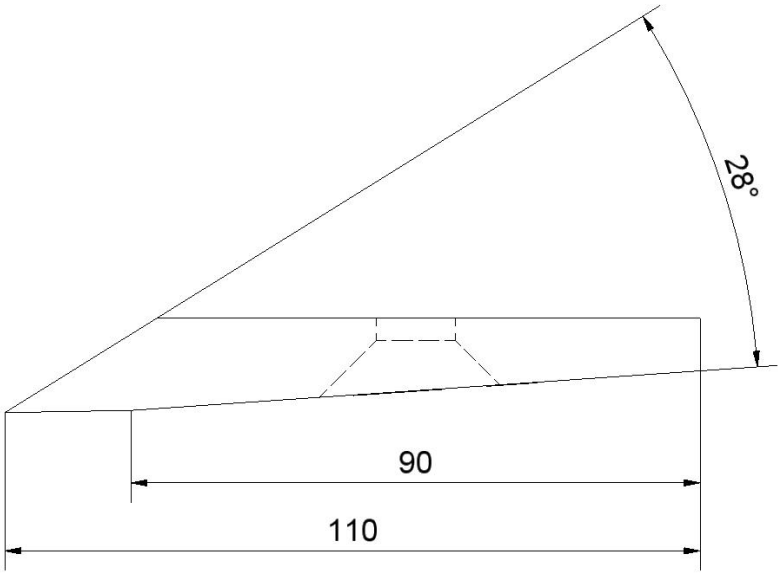
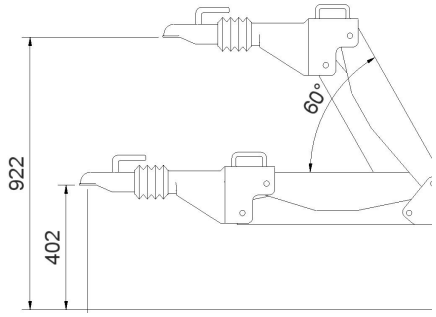
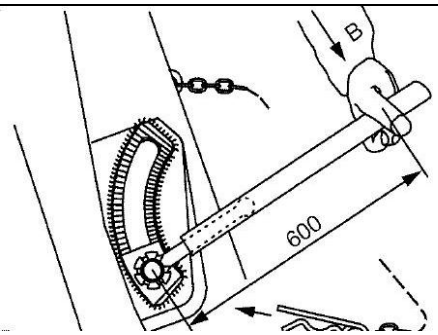


Figure 21 Grinding angle and minimum knife width for chipping knives

 ©Copyright 2008

9 Special instruction for TP 250 MOBILE TURNTABLE

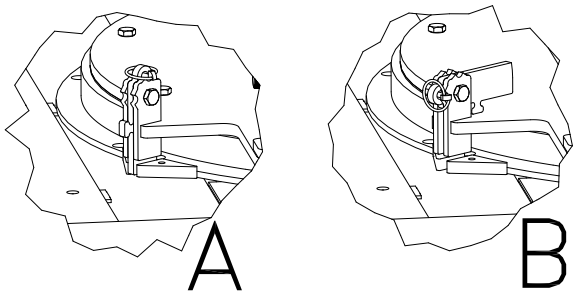
The TP 250 MOBILE TURNTABLE is a trailer mounted wood chipper comprised of a trailer upon which a wood chipper with own engine is mounted. The trailer can be coupled to a vehicle with a ball and socket head as a coupling without inspection.
As accessory, the ball and socket head can be replaced by a pintle eye.
The height of coupling can be adjusted from 402 mm to 922 mm.

	
	B = 42-50 kg (M = 250-300Nm) Remember split pin

After adjusting the height, the position must be secured by tightening the screw connection with the above factor. Remember to lock the screw connection with a split pin!

Transport on public roads

When driving on public roads, the ejector tube must be turned backwards and secured against rotation.
During transport the locking mechanism on the turntable must be secured against rotation and secured with a ring split pin.
Pos A = Transport
Pos B = Work position



The retractable hopper must also be tipped up and secured with a ring split pin.
When coupling, the 7/13 pole connector and the safety chain must be coupled to the vehicle.
The supporting leg must be raised.
The hand brake is released before driving.
Check the lights and the brakes before driving.

Measurements of the trailer: Width 2200 mm. Length 4200 mm. Height 3200mm
Tire assembly: 165R13C/8
Tire pressure (cold), max.: 450 kPa = 65 psi. = 4,5 bar

In order to avoid destroying the electrical system, the following points must be respected:

1. **The ignition key must never be in neutral during operation.**
2. **The earth connections must be clean.**
3. **When using a battery charger, the earth cable on the battery must be dismantled.**

Instruction for wood chipper: See TP 250 PTO

©Copyright 2008

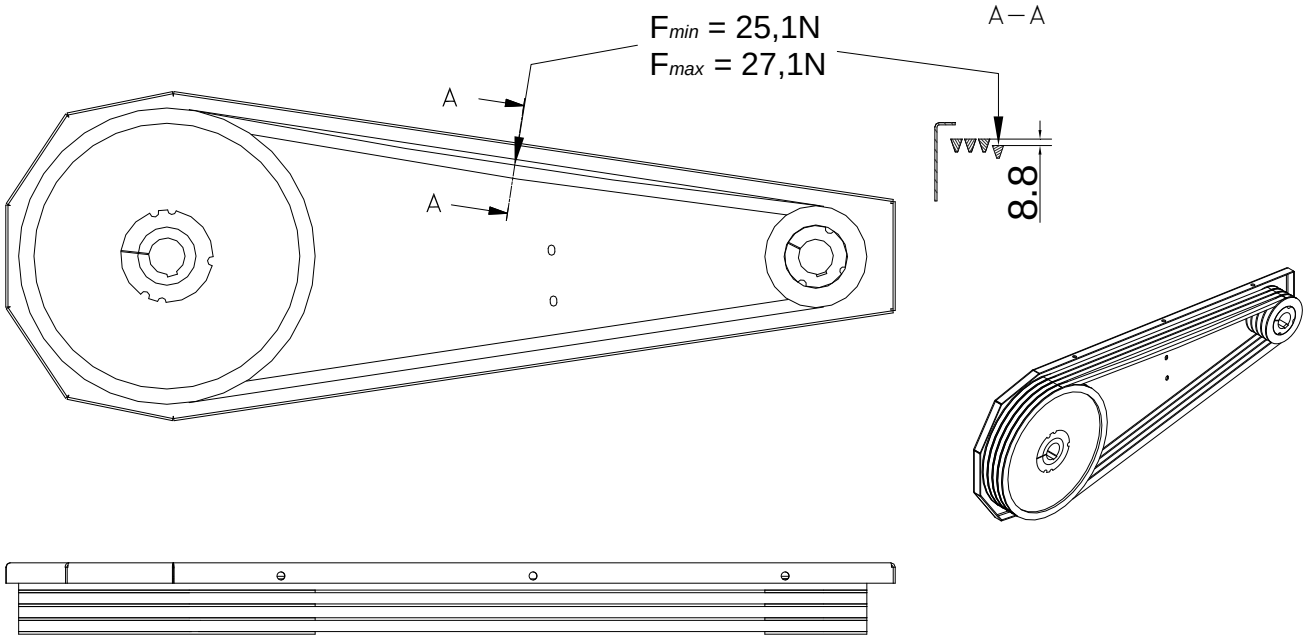
Service and guidance for engine: See the enclosed service manual or www.hatz.com
Engagement of the wood chipper.

At cold starts: Start the engine. Set the throttle so the engine runs smoothly at low revolutions. Let the engine run 30-60 seconds depending on the temperature. Then the wood chipper is engaged slowly and the rpm are increased to working speed "full throttle".

At warm starts: Same approach is followed. Only it is not necessary to let the engine heat up before engaging.

The wood chipper must not be engaged at full throttle.

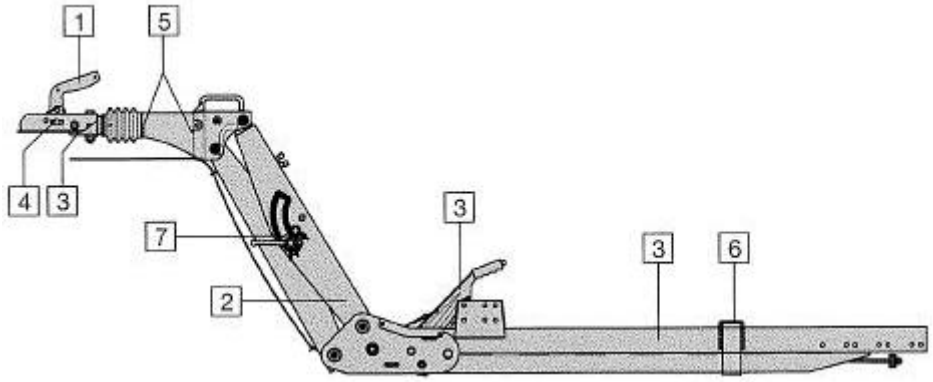
When stopping: Let the wood chipper run out of material. Disengage the wood chipper. Let the engine run idle for approximately 30 seconds before the throttle is turned to stop.
Turn the ignition key to neutral. (See symbols on the starter box).



Check of V-belts and wood chipper:
Stop the engine and make sure the rotor is stopped. Dismantle the outer screen over the V-belts.
If the belts need tightening:
Loosen the bolts which hold the wood chipper to the engine console. The tightening bolt is tightened so the wood chipper is pushed to the side.
Check that the two belt discs are parallel and are aligned.
Then tighten the bolt and the counternut. (Check the belt tension again).
Finish by mounting the screen.

©Copyright 2008

Maintenance of the tow bar.



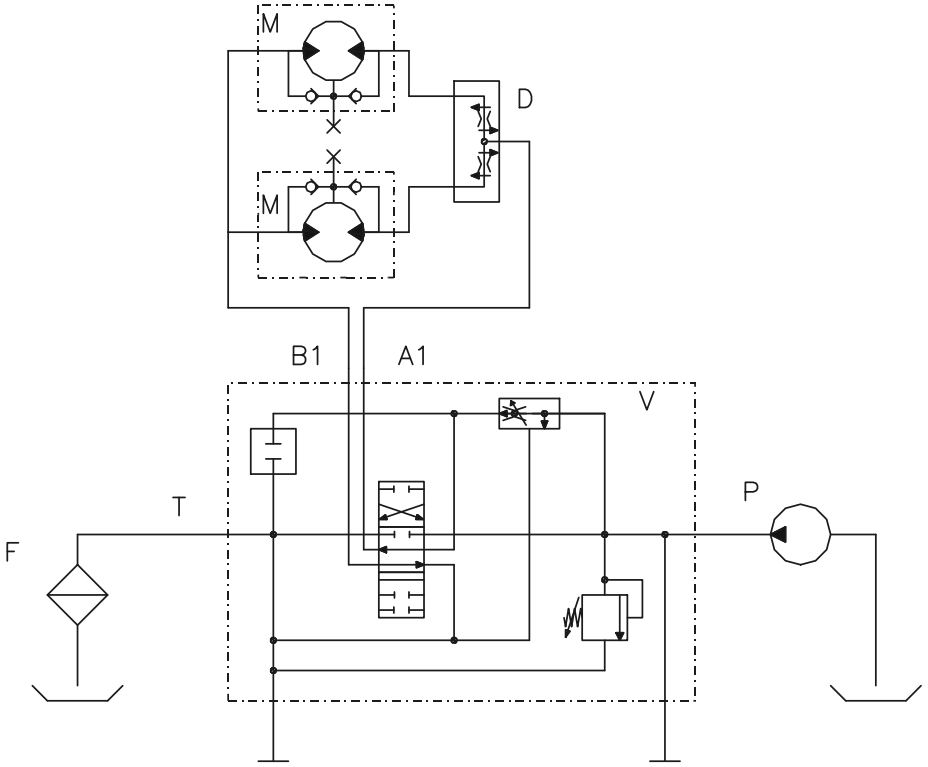
	Maintenance schedule BPW-Special Long range grease ECO-Li 91	Before use	After the first drive	After all adjustments	Approximately 50 km after adjustment of tow bar	After approximately 500 km	For every 2-3000 km At least once a year
1	Test the overrunning brake and ball and socket coupling.	x					x
2	Test the adjustment of the tow bar.	x				x	x
3	Test the hand brake.	x				x	x
4	Lubrication of ball and socket coupling.	x					x
5	Lubrication of the overrunning brake.						x
6	Tightening of the fastening bow.		x				
7	Tightening of the castle nut.	x		x	x		

Lubrication of 3 nipples on the turntable for every 50 hours.

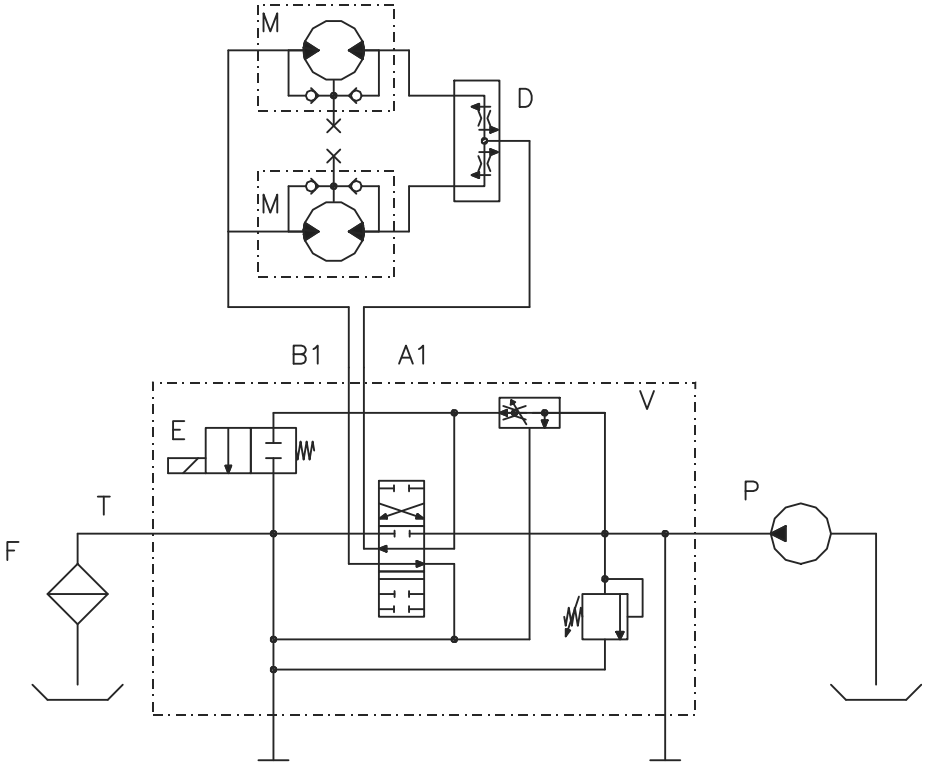
Service and guidance for engine: See the enclosed service manual.

©Copyright 2008

10 Hydraulics diagram, TP 250 without revolution guard

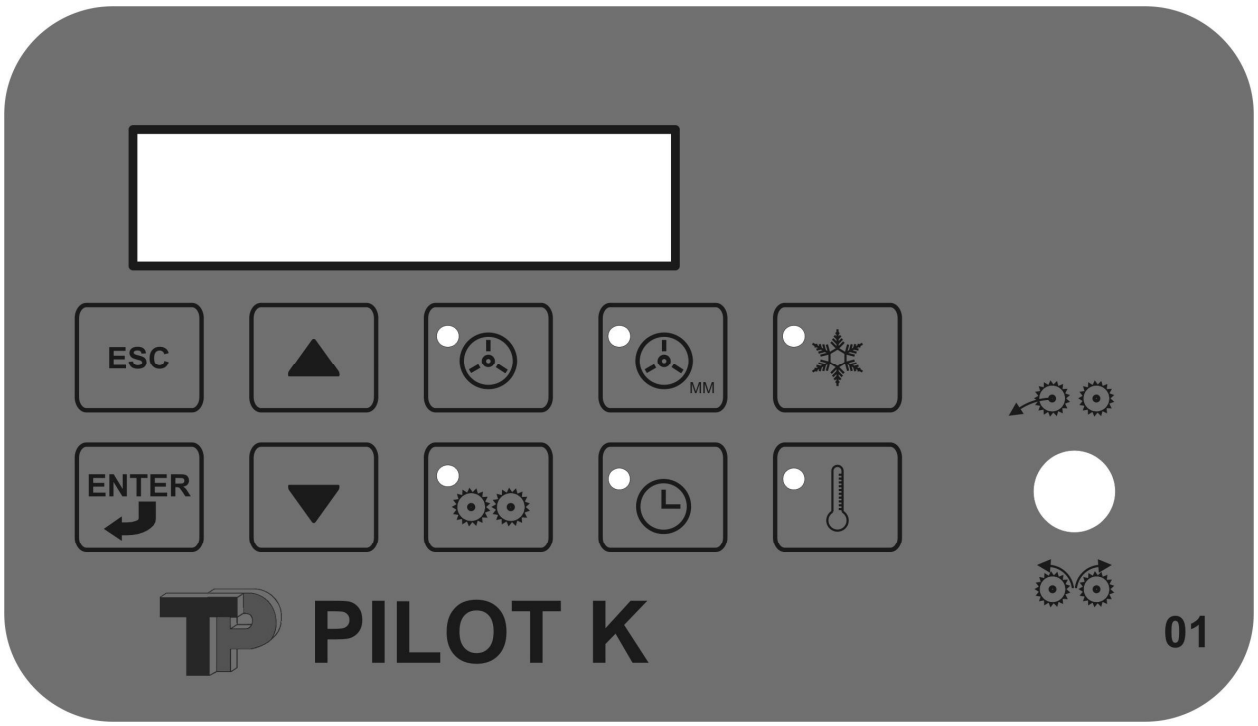


11 Hydraulics diagram TP 250 with revolution guard



©Copyright 2008

12 Instruction for TP PILOT K



Overall description of the system:

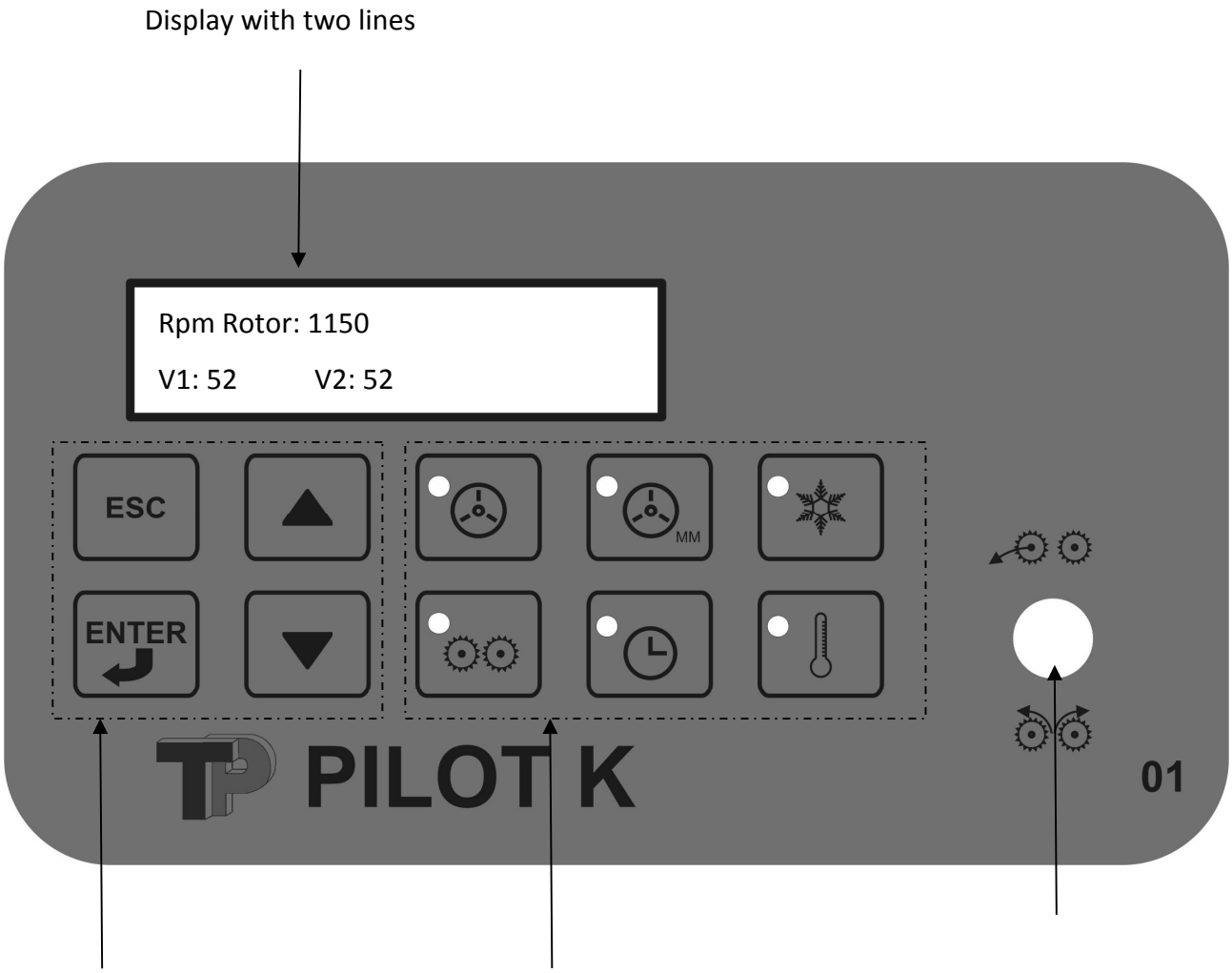
During normal operation of the machine, the desired chip size is set by setting the position of the knives and punching in the setting of the knifes followed by a calibration of the rollers. The wood chipper can now be used by putting the rpm of the knife over the set start value where the rollers start pulling in wood material. As long as the rpm of the rotor are between the low and high limit value, the rollers will rotate so the material between the rollers will be pulled toward the knives. The rpm of the rollers will be adapted to the rpm of the knives so the desired chip size is maintained.

It is recommended that the 12 V power supply is run through an emergency stop button which removes the power supply to the PILOT K and the crane.

©Copyright 2008

12.1 Description of the TP PILOT K control panel.

Below is an overview of the control panel for the control with specification of the placement of the buttons and switches.



©Copyright 2008

12.1.1 Display

Overview of all the control's displays and descriptions of every display are found in appendices 1 and 2.

Setting the display contrast:

The display contrast is set by holding the Esc button in while pushing the ▲ button or the ▼ button.

Work display.

The work display shows the rpm of the rotor and the two rollers.
On type TP 230/250, only the roller rpm is shown.

Rpm Rotor: 1150
V1: 52 V2: 52

By pushing the ▲ button or the ▼ button the display changes between the following displays:

- Showing the rpm of the rotor.

Rpm Rotor
1150

- Showing the rpm of the rollers. On type TP 250, only one roller rpm is shown.

Rpm Rollers
V1: 52 V2: 52

- Showing the set knife setting in millimetres. Possibility for changing the value.

Knife setting
12 ENTER

- Showing the time for the present job. It is shown in hours and minutes. Possibility for resetting.

Job Time
1:48 ENTER

©Copyright 2008

- Showing the total work time of the machine. It is shown in hours and minutes.

Total Time
10:18

- The current temperature of the oil in Celsius. (Accessory)

Oil temperature
26 C

The displays shown are also available through a specific display button described below.
(See also Appendix one; User display).

12.1.2 The computer's control buttons.

The computer's control buttons are described below.

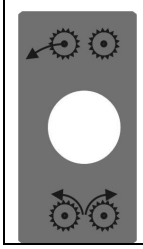
	Display change and changing entry values.
	ENTER button. Change to entry display, approving an entry and start calibration.
	The ESC button is used to delete an entry of a value, or to leave a given display and go to the preceding display. Repetitive pushing will always result in the showing of the work display.

 ©Copyright 2008

12.1.3 Display buttons with LEDs.

	Display change to showing the rpm of the rotor. When the display is active, the LED will light up.
	Display change to showing the knife setting entered. When the display is active, the LED will light up. Possibility for changing the knife setting.
	Display change to display for oil heating. When the display is active, the LED will light up. A new push which is held for two seconds will start the heating of the oil. The oil heating will only start if the oil temperature is lower than ”Temp. Oil Heating” or if a sensor has not been put in. If a sensor has been put in, the oil temperature will be shown. If a sensor has not been put in, the time from the start of heating will be shown in minutes. When the oil is heating an LED will blink. The oil heating will stop when the temperature reaches ”Temp. Oil Heating”. Or by pushing the button again.
	Display change to showing the rpm of the rollers. When the display is active, the LED will light up. If the control is put in reverse, an LED will light up no matter which display is showing in order to indicate that the rollers are in reverse. If the percentage difference between the rollers is larger than the entered value, the LED will blink no matter which display is shown. At the same time an alarm will sound. Not TP 250
	Display change to showing the time registered for job. When the display is active, the LED will light up. A new push will change display to showing the machine’s total time. Push ENTER in for two seconds.
	Display change to showing oil temperature. When the display is active, the LED will light up. If a sensor has been put in, the current temperature will be shown. If a sensor has not been put in, and ”Temp. Oil Heating” is smaller than 99 the error message ”Sensor error” will be shown. If a sensor has not been put in, and ”Temp. Oil Heating” is 99 the message "Sensor not installed" will be shown.

12.1.4 Switch for machine operation

	The switch will move to the middle position when it is not being pushed. Switch up is not an issue on this type of machine. A short push down will entail the rollers reversing the number of pulses which have been set in the control. Holding the switch down entails the rollers reversing while the switch is held down. For both functions an alarm will also sound.

 ©Copyright 2008

12.2 Functions

An overview over the control's display can be found in appendix 1; User display. An overview over every display can be found in appendix 2; Description.

12.2.1 General display showings and button functions

If "ENTER "is shown on the display it means that Enter must be pushed down for two seconds in order to get access to changing values or to activate underlying displays.

A blinking value means that the value can now be changed with ▼ and ▲.

Esc always brings the previous display back and in the end will show the work display.

If a value is blinking and you do not want to change this value then just push Esc, then the display is left without the value being changed.

in order to get access to the machine's functions and setup, a code has to be entered. The access to entering the code is gained by pushing the Enter and ▼ buttons and holding them in for two seconds, then this display is shown.

Machine setup
Code 0

User codes are code 3 and code 5.

Code 3 gives access to machine setup.

Code 5 gives access to calibration of the rollers. (not relevant for this type of machine).

Machine setup

Enter code 3 in the code entering display. Then the following display is shown with the possibility to change the different machine parameters:

- The rpm of the rotor where the retraction of the rollers starts

RPM start
1000 ENTER

.

- The low rpm of the rotor where the retraction of the rollers stops

RPM Stop
850 ENTER

 ©Copyright 2008

- Number of pulses the rollers reverses when they are stopped because of low rpm of the rotor.
  On the TP 250, the rollers do not reverse, value = 0.

Pulses Reversing
15 ENTER

- Minimum temperature for starting the retraction of the rollers.

Temp. Oil Heating
20 C ENTER

12.3 Setting roller speed.

Regulation by adjusting the flow valve (see fig 12).
The speed of the rollers must be set according to the current position of the knives, cf. the table below.

Position / Model	Rotor Rpm	8 mm	10 mm	12 mm	13 mm	15 mm
TP 250 PTO K	*1000*				55	

Alternatively the current roller speed can be seen directly in the display on the PILOT K.

After setting the position of the knives on the PILOT K, the following is done:

Push and at the same time and the following display will be shown:

V0 states the calculated roller speed.

Ro: 0 0: 0:1000
V0: 28 V1: 0 V2: 0

V1 / V2 states the current roller rpm. Notice that the rotor rpm must be over RPM Start or the rollers will not turn.

A roller alarm is tied to this display. The roller alarm is activated if V1 or V2 is greater than V0. This can be used for setting the roller rpm. The roller alarm will sound with 2 second intervals. At the same time the LED will blink at the button with the roller symbol.

 ©Copyright 2008

12.4 Alarms

Alarms are always activated with sound.
There are alarm for:

- Temperature sensor fault.
- Temperature too low.
- Temperature too high.
- Too big difference on the rpm of the rollers.
- Both rollers are stopping.
- Manual reverse of rollers.
- Manual open rollers.

Temperature alarms and roller alarms are sounded with 5 beeps.
Manual reverse and manual open rollers are sounded with 2 beeps.

12.5 Comments

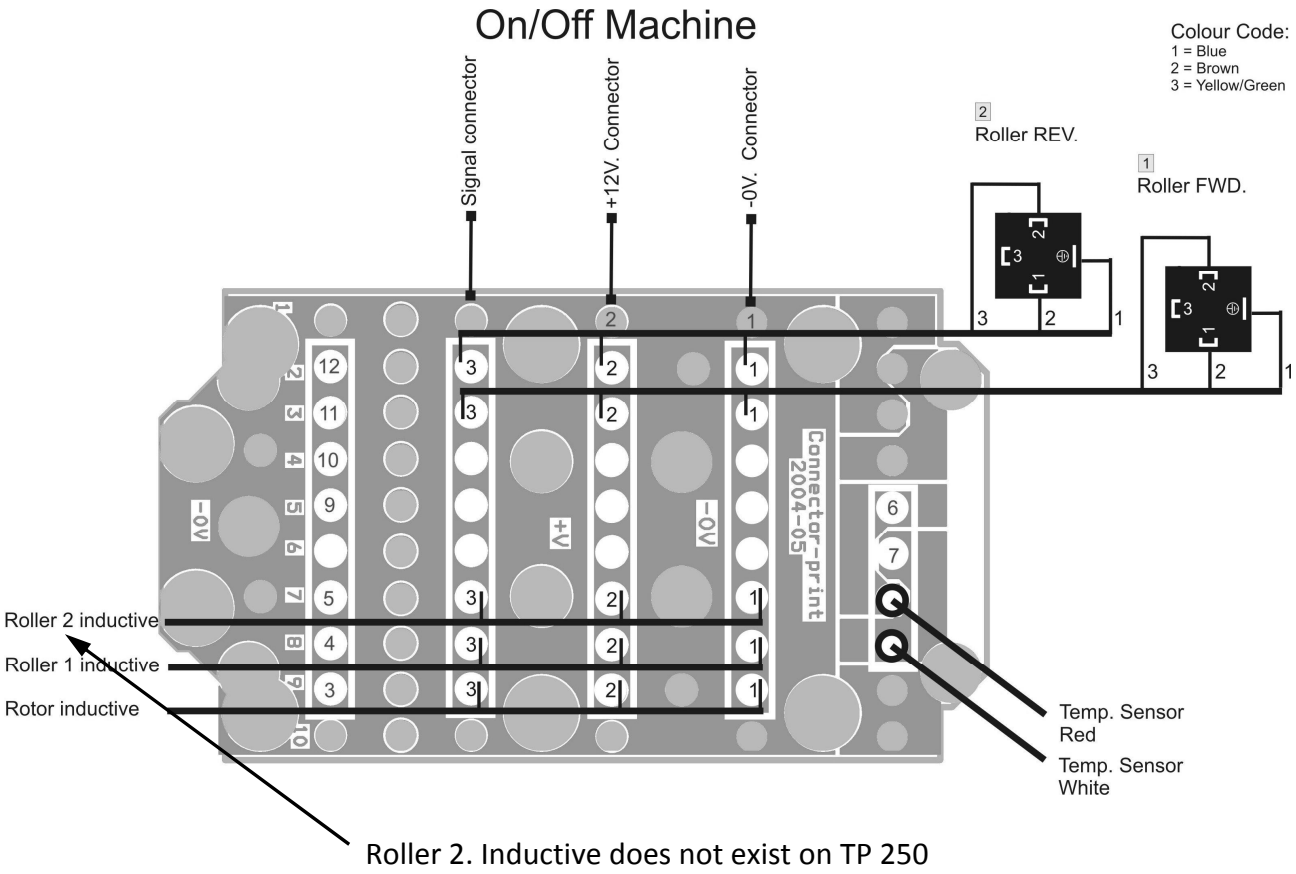
Pay attention to not performing welds on the machine where the control is mounted, without disconnecting all cables, power supply, sensors, communication etc. from the control, and it is recommended that the ground cable for the welder is put in the near vicinity of where the welding is going to take place. If these recommendations are not followed, the control can suffer irreparable damage.

12.6 Technical data

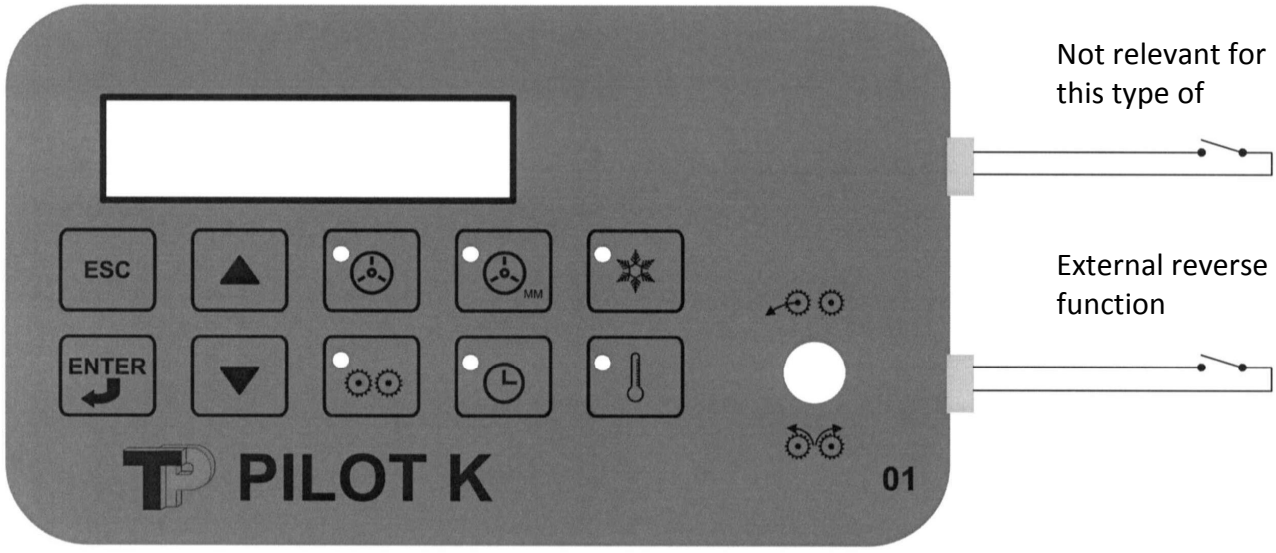
Power supply	+12V dc
Temperature range	0°C – 50°C
Fuses	T3,2A/250V

©Copyright 2008

12.7 Electrical mounting

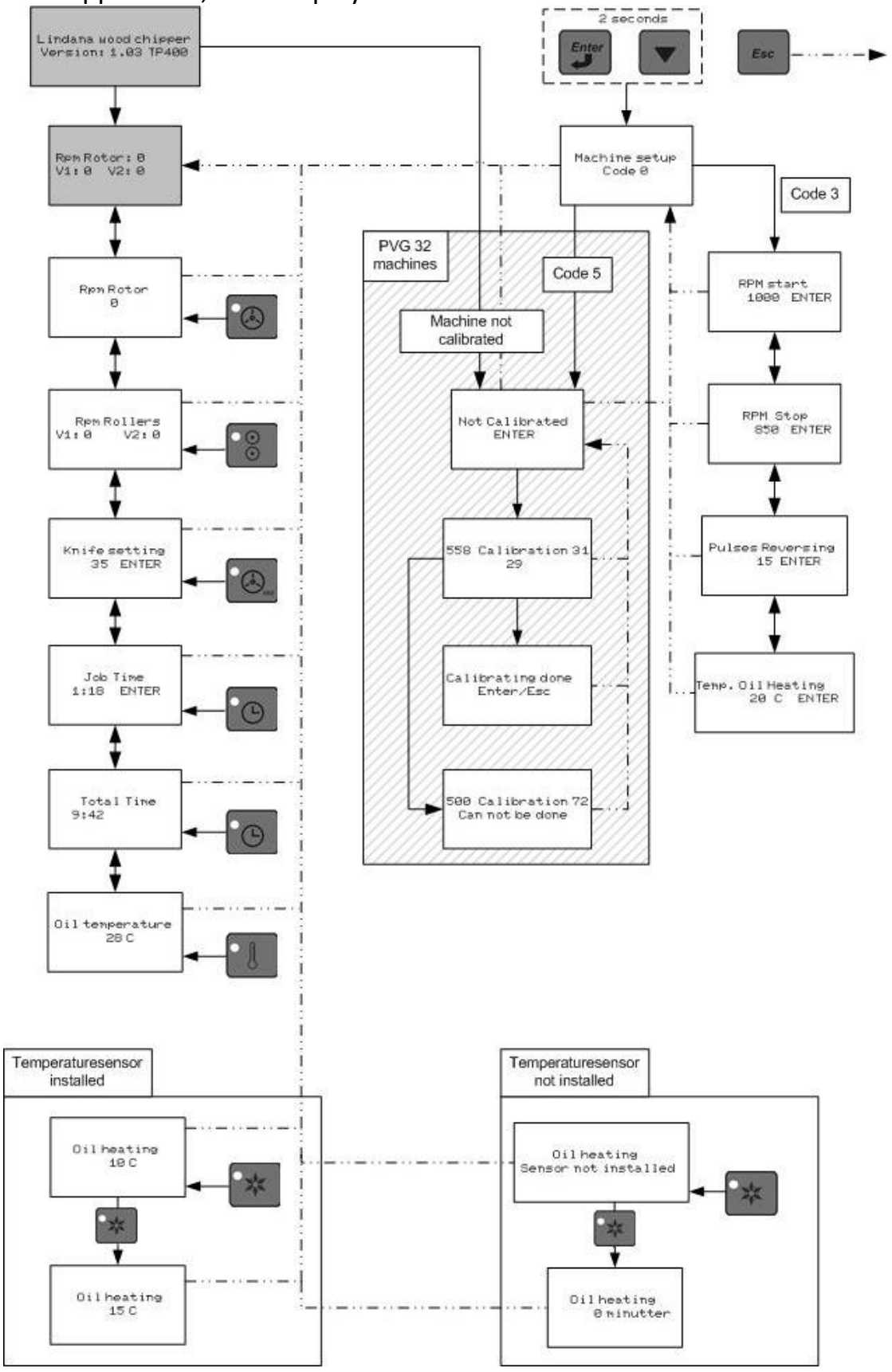


External functions



©Copyright 2008

12.8 Appendix 1; User display



©Copyright 2008

Appendix 2; Description of user display.

Start display.

Display	Description
Lindana wood chipper Version: 1.14 TP250	Information: Shows the software version as well as machine type.

12.8.1 Work displays.

Display	Description
Rpm Rotor: 0 V1: 0 V2: 0 Rpm Rollers (TP 230/250)	Information:(Main display) Current rpm on rotor. Current rpm on roller 1 and roller 2. Current rpm on rollers.
Rpm Rotor 0	Information: Current rpm on only the rotor. Can be used if this information in overwritten by fault messages in the main display.
Rpm Rollers V1: 0 V2: 0 Rpm Rollers (TP 230/250)	Information: Current rpm on only the rollers. Can be used if this information in overwritten by fault messages in the main display.
Knife setting 15 ENTER	Information: Knife setting in mm. Can be changed by holding the enter button in for two seconds.
Job Time 0:16 ENTER	Information: Current job time in hours and seconds. The job time is only registered when the rollers are running. The job time can be reset by holding the enter button in for two seconds.
Total Time 0:16	Information: Show the machine's total work time in hors and minutes. The total time is only registered when the retract rollers are running.
Oil temperature 26 C	Information: The current temperature of the hydraulic oil in Celsius.
Oil temperature Sensor not installed	Information: The sensor is not put in and "Temp. Oil Heating" is set for 99.
Oil heating 10 C	Information: The current temperature of the hydraulic oil in Celsius.
Oil heating Sensor not installed	Information: The sensor is not put in and "Temp. Oil Heating" is set for 99.

 ©Copyright 2008

Display	Description
Oil heating 10 minutes	Information: The sensor is not put in and ”Temp. Oil Heating” is set for 99. Shows how long the oil heating has been activated.

12.8.2 Machine setup (code 3).

Display	Description
Rpm start 1000 ENTER	Information: Rotor rpm for start of retraction.
Rpm Stop 850 ENTER	Information: Value of stop for retraction at too low rotor rpm.
Pulses Reversing 15 ENTER	Information: Desired number of pulses the rollers should reverse.
Temp. Oil Heating 26 C	Information: The temperature the oil must have before start of retraction is started. This value must be set at 99 if the sensor has not been put in.

 ©Copyright 2008

13 Troubleshooting for wood chipper TP 250

Check possible causes before contacting the distributor.

Problem / Possible cause	Solution
The rollers are not spinning satisfactorily:	
Not enough oil in the hydraulics system	Fill up with hydraulic oil
The flow valve is screwed out too far	Turn up the flow
The stationary roller is blocked	Clean under and behind the roller
The bypass valve is dirty	Clean the bypass valve
The revolution guard is blocking	Increase the rpm on the rotor
The operation bow is in the 0 position	Put the operation bow in the A position
The rollers are not pulling satisfactorily:	
Not enough flow	The flow valve is turned (opened)
The V-belts are too slack	Tighten the V-belts
The hydraulic oil gets too hot	Let the machine cool down while checking why
Too poor viscosity of the hydraulic oil	Change the hydraulic oil
The hydraulic filter is clogged	Change the hydraulic filter
The oil pump is worn or damaged	Change the hydraulic pump
The oil engine is defective	Change the oil engine
The pressure control valve in the control valve is dirty	Clean the pressure control valve
Chip quality is not satisfactory:	
The knives are dull	Grind the knives
The anvil is worn	Turn/change the anvil
The knives are worn too far down (<106 mm)	Change the knives
The distance between knife and anvil is too big	Adjust the distance between the knives and anvil
Sliver breaker not mounted or worn	Mount or change the sliver breaker
Poor ejection of the chips:	
Not enough drive	Not enough effect on the PTO axle or the engine
Scrapers are worn	Change the scrapers
Ejector wings are worn	Change the ejector wings
The facing plate in the top part	Remove the facing plate in the top part
Not enough revolutions on the machine	Increase speed to maximum revolutions

 ©Copyright 2008

14 Guarantee obligation for wood chipper

The guarantee is valid for 24 months after date of purchase for the relief of faults which are provable to the material or manufacture. The guarantee covers defective components which are repaired or changed.

Transportation costs and wages for changes are the responsibility of the customer.

Upon any claims, the changed parts must be sent to Linddana for investigation.

Linddana alone decides whether the claim can be approved.

The following is an excerpt from Linddana's Terms of Sales and Delivery (item 4 and 5).

Claims

Any and all risk concerning the goods is passed to the buyer at the time of delivery of the goods. A claim concerning the goods has to be done in writing to Linddana as quickly as possible, and no later than 8 days after delivery. If Linddana has not received the claim before the deadline stated, the objections to quantity and quality that the buyer might have will lapse.

Linddana is entitled and obligated to correct any and all faults which are caused by the construction, material or manufacture. Linddana alone determines whether the remedy is to be done with repairs or changes of the defective parts. In case of repairs, the buyer is obligated to deliver and collect the goods sold in the workshop determined by Linddana at no expense to Linddana. In case of changing the defective parts, the buyer is obligated to send in the defective parts to Linddana at no expense to Linddana. Linddana is entitled to changing the defective goods.

Linddana's responsibility only covers faults which occur within a year of the goods sold being delivered.

Linddana has no liability besides those stated in the present item. This includes any loss the fault might cause including loss of work, loss of earnings and other economical implication losses.

Guarantee conditions

If Linddana has decided to grant a guarantee, then this has faults in the construction, material or manufacture. A guarantee granted by Linddana does not cover faults which occur as a result of imperfect maintenance, incorrect mounting, changes made by the buyer or wrong use of the good. The guarantee furthermore does not cover normal wear and tear or deterioration. Linddana's guarantee obligation presupposes that the buyer documents that a stated fault is not due to the conditions which are exempt from the guarantee cf. afore-mentioned.

The buyer must let Linddana know in writing about any faults to the goods sold no later than 8 days after the fault should have been realized by the buyer. If the buyer does not let Linddana

 ©Copyright 2008

know before the expiration of this deadline and before the guarantee period runs out, the buyer looses the right to make any claims concerning the fault.

Linddana is entitled and obligated to remedy any faults which are covered by a guarantee granted by Linddana. Linddana alone decides if the remedy is to be done as repairs or changes of the defective parts, everything under the terms stipulated in item 4.

Linddana has no other liability for those faults. This includes any loss the fault might cause including loss of work, loss of earnings and other economical implication losses.

The guarantee does not cover:

- If a defect with just cause can be attributed to inappropriate use.
- Use of unoriginal spare parts, including worn parts.
- Wrong adjustment or use of the machine.
- Use of wrong lubricant or hydraulic oil.
- Wear on cross at PTO axle.
- Tightening spring for rollers.
- V-belts.
- Knives and anvil which break because of foreign bodies in the machine.

 ©Copyright 2008

15 Technical data wood chipper

Type	TP 250 PTO	TP 250 MOBILE TURNTABLE	TP 250 PTO K
Chipping principle	Disc chipper	Disc chipper	Disc chipper
Rotor disc diameter, mm	960	960	960
Number of revolutions PTO rpm*	1000	930	540-1000
Knives, pieces	3	3	3
Effect need min/max kW/(HP)	45-104/(60-140)	47/(64)	45-104/(60-140)
Max. Wood diameter, mm	250	250	250
Chip length, mm	13	13	13
Weight, kg	1065	2200	1030
Height, mm	2940	3200	1365 + *
Width, mm	1550	2200	1625
Length, mm	2020	4200	1871

PTO transmission axle: Walterscheid type 2400 with free running and friction coupling.

Rights to changes in the construction and specifications without previous notice reserved.

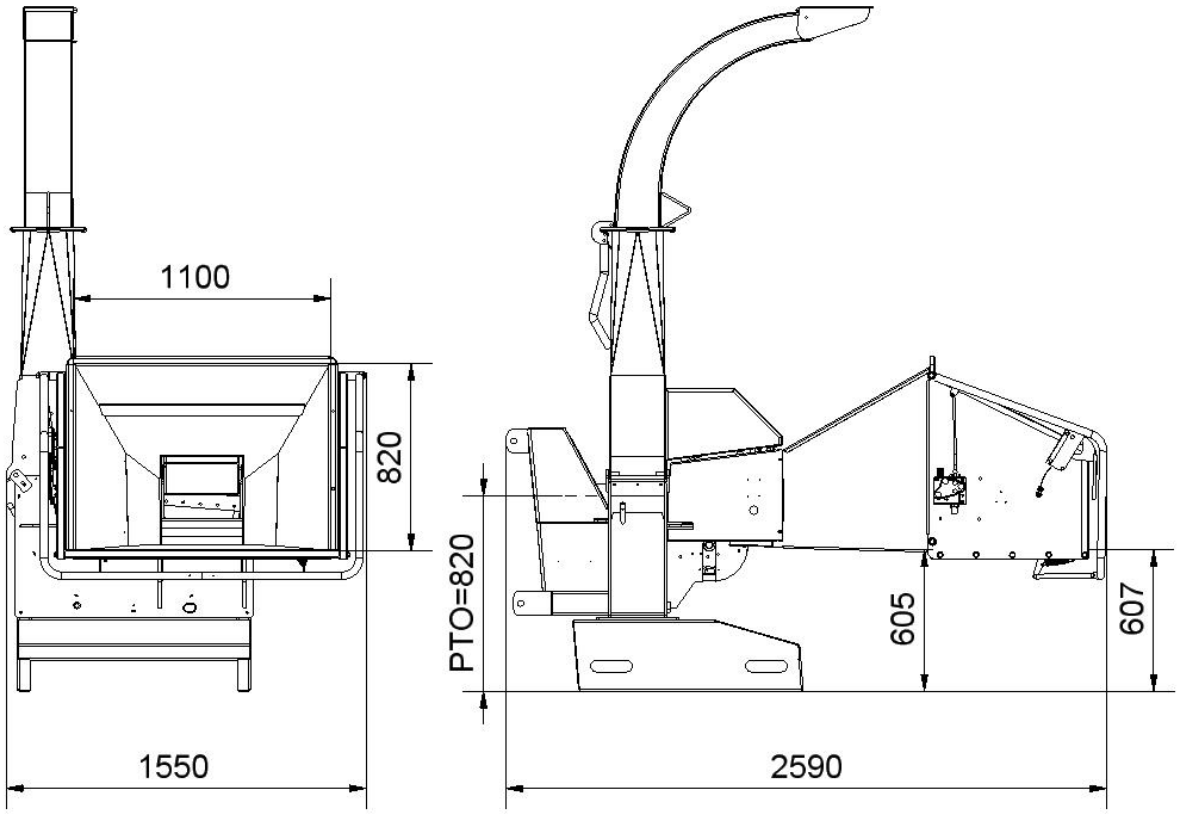


Figure 22 Dimensional sketch TP 250 PTO

©Copyright 2008

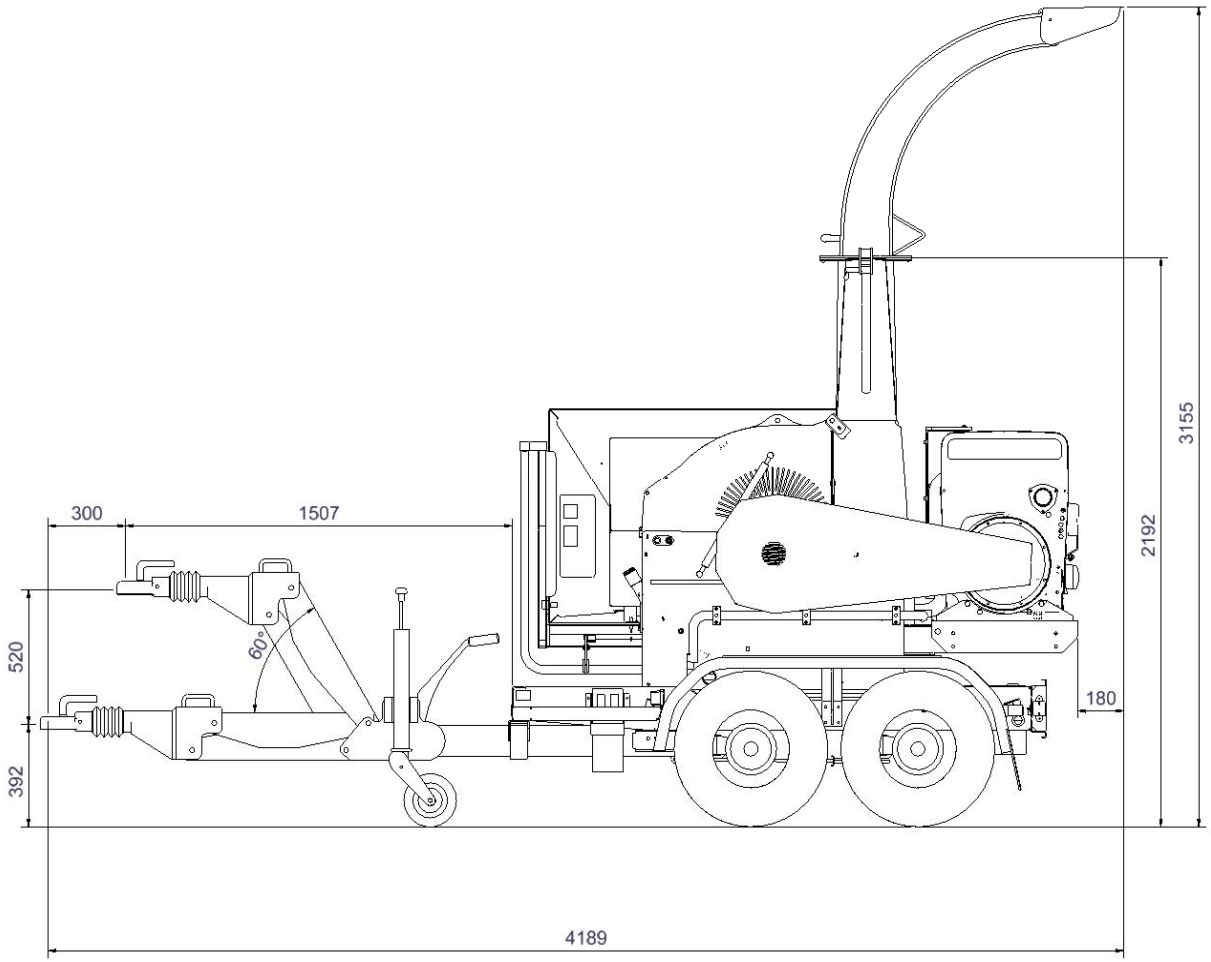


Figure 23 Dimensional sketch TP 250 MOBILE TURNTABLE

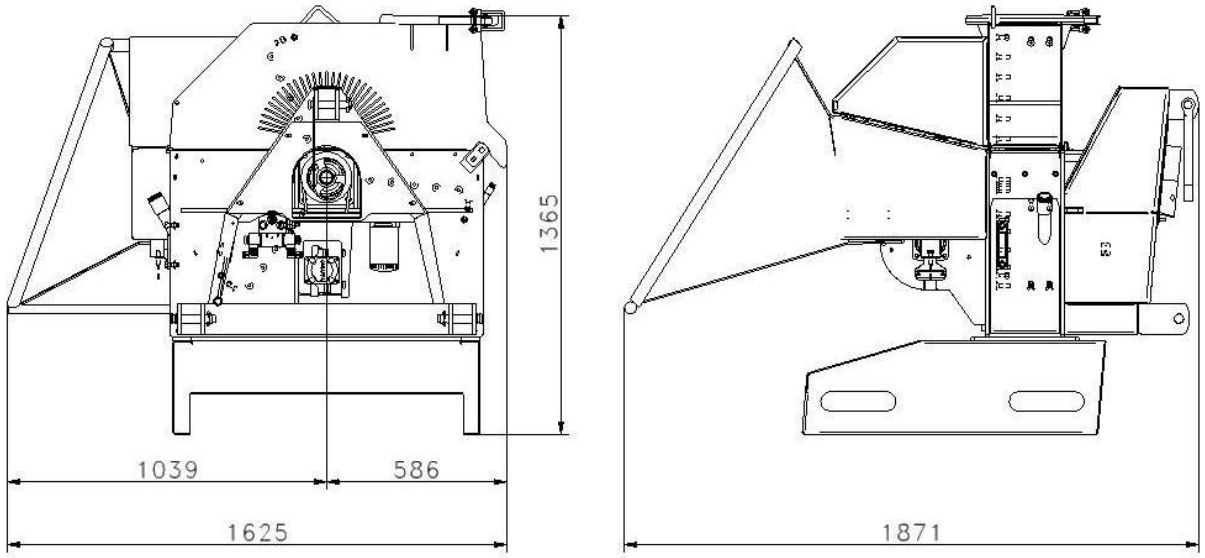


Figure 24 Dimensional sketch TP 250 PTO K

 ©Copyright 2008

16 Accessories

- Tool kit incl. torque wrench.
- Prolonged ejector tube horizontal.
- Extension for ejector tube vertical.
- Lock for ball and socket coupling (TP 250 MOBILE TURNTABLE).
- Light boom (TP 250 PTO).

17 Spare parts catalogue

©Copyright 2008